

An Assessment of the
**Economic Impact of
Military Spending**
in **Missouri**





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Section I: Executive Summary

Economic Impact of Military Spending in Missouri

Military spending in Missouri comes from two federal agencies, the Department of Defense (DoD) and the Department of Energy (DoE). The DoE supports the Kansas City National Security Campus operated by Honeywell, while DoD funds all the other military facilities and assets across the state. In addition, DoD contracts with many Missouri-based companies for various products and services. DoE's contracts were almost exclusively to support the National Security Center in Kansas City and is accounted for in our analysis. Both agency's military spending impact Missouri's economy and both will be included in the analysis in this report.

Between FY13 and FY15, DoD spent over \$14 billion average per year in Missouri and DoE spent an average of \$700 million. Putting this in perspective, in FY14, DoD spent \$418 billion in payroll and contracts across the U.S. or about 2.4% of U.S. GDP. While defense spending grew 68% from 2000 to 2010, it has been declining since 2011 and is expected to decline by 28% by 2019¹.

Missouri's GDP for FY2015 was \$261 billion². Military spending in Missouri for FY15 was 5% of GDP for the state or approximately \$14 billion. The biggest portion of that spending (over \$9 billion) was for contracts with Missouri-based companies. Those contracts were to produce goods and provide services to support not only DoD operations within Missouri, but nationally and internationally as well. A large portion of that contracting is with the aerospace industry (over \$6 billion). In addition, DoD operations within Missouri resulted in visitor spending from the Whiteman "Wings over Whiteman" airshow (record 75,000 attendance in FY15) and visitors to the training graduations at Ft Leonard Wood.

The results are the \$14 billion per year in military spending over the past three fiscal years (FY13-15) has resulted in an average of \$32 billion per year in goods and services being purchased from Missouri companies and 183,000 jobs per year created in the state. In other words, for every \$1 of military spending invested in the state, Missouri has sold over \$2.50 in goods and services it would not have otherwise sold and created jobs for almost 200,000 Missourians.

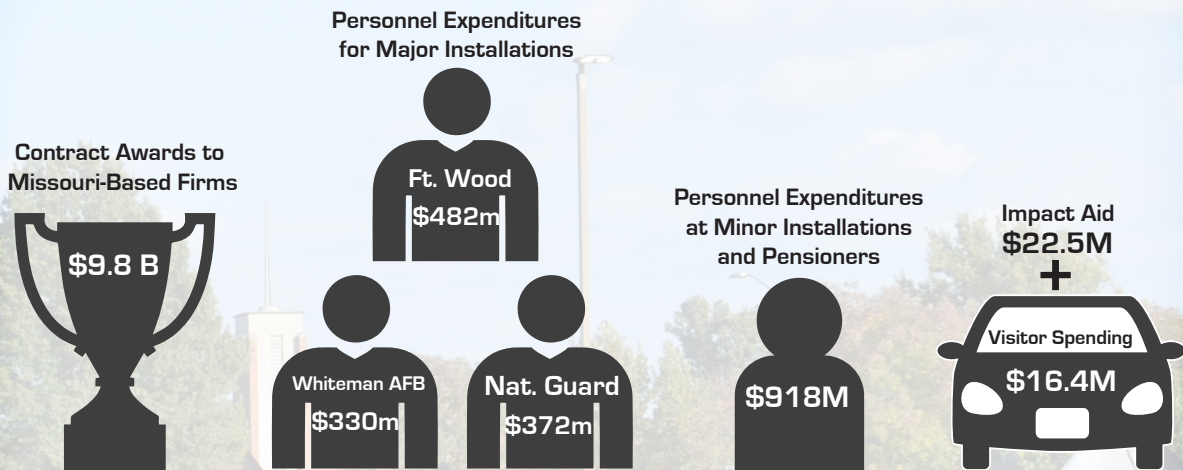
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¹Source: OEA FY14 Defense Spending by State

² Source: Missouri Economic Research and Information Center

Figure 1- Summary of Economic Impact of Military Spending in Missouri

Annual Direct Expenditures in Missouri



\$14 billion Total Average Expenditures



Multiplier Effects to Economic Activity in Missouri

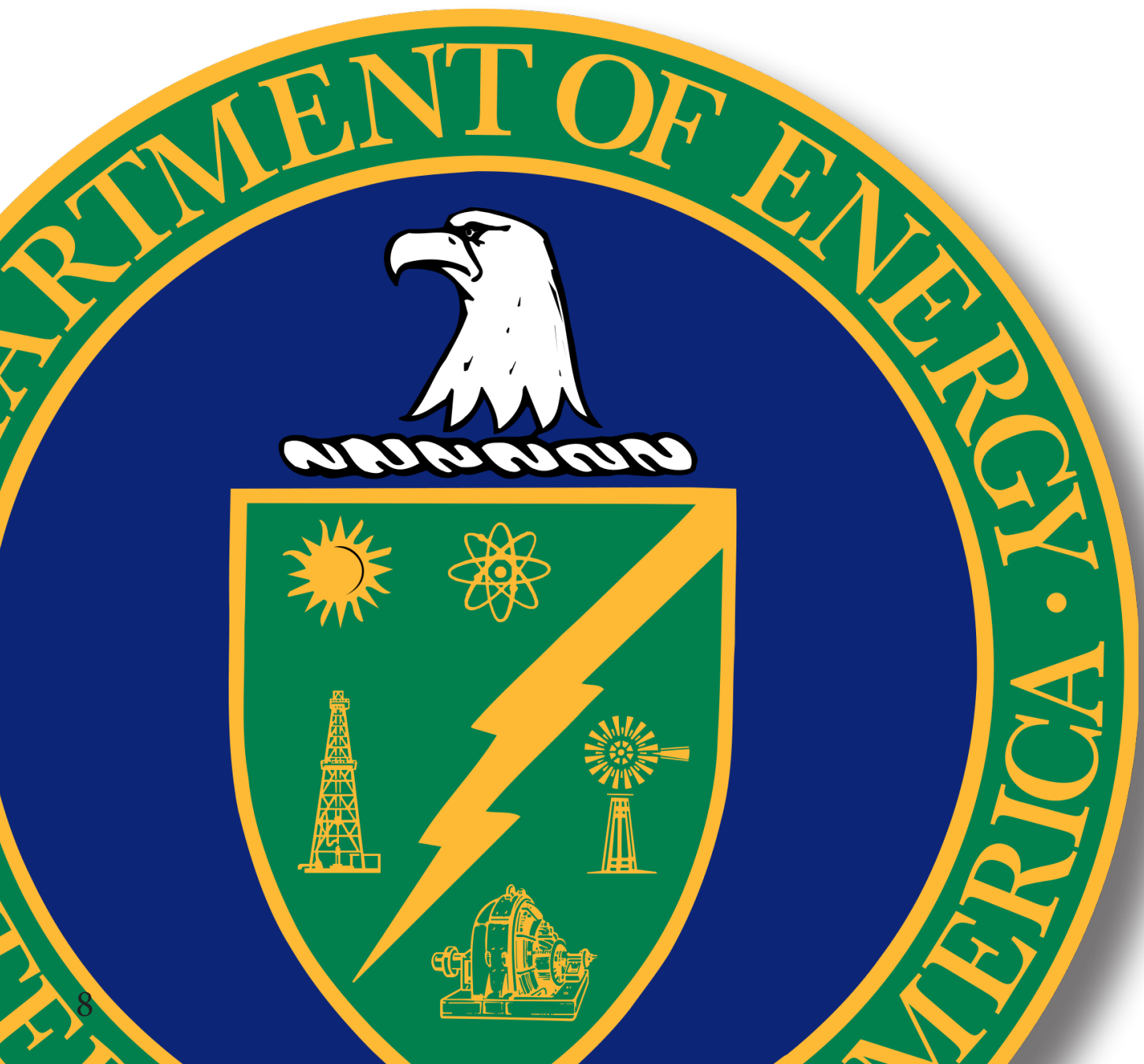


Total Annual Economic Impact to Missouri

Chapter 1:

Department of Energy Operations in Missouri

The Department of Energy supports the National Security Campus in Kansas City, Missouri which is managed and operated by Honeywell corporation. That facility is responsible for manufacturing or procuring non-nuclear components for nuclear weapons. For fiscal 2013-2015 the average budget for that facility was \$625 million and supported over 2500 jobs. The total economic impact of that operation was \$3.6 billion per year and over 9,600 direct and indirect jobs created per year.



Chapter 2:

Department of Defense Operations in Missouri

The Department of Defense operates several major and minor installations throughout the state, which support operations for the nation's military branches. This spending includes payroll to military and civilian personnel, operational expenditures at installations, contracted goods and services to support installation operations, construction and other capital improvements for programs and maintenance on facilities in the state, and pension payments to retirees.

Department of Defense spending in Missouri is represented by the Department of the Air Force, Department of the Army, the Department of the Navy (includes U.S. Marine Corps), National Guard, and agencies of the Office of the Secretary of Defense. All of these departments and agencies impact the Missouri economy through their operations at the major installations such as Whiteman Air Force Base and Fort Leonard Wood, but there are also significant impacts from operations at smaller installations, which are mostly concentrated in the major population and employment centers in the state (St. Louis, Kansas City, St Joe, Springfield, and Jefferson City regions). In addition to these installations directly hiring employees, they also contract with various vendors across the state to provide goods and services, which in turn hire their own staff and contribute to the state's economy. Additionally, the Department of Defense pays pensions to retired military personnel living in Missouri, which is additional household income in the state.

The amount each installation spends within the state of Missouri is harder to evaluate and impossible to use in a quantitative analysis. Installations make a good faith effort to spend locally, but often need to source goods and services outside of the area due to price, availability, and logistics. Therefore, regardless of how much an installation spends on procurement contracts and other services for their operations, the specific economic impacts of that installation within the state are unknown. However, when

considering the aggregate impacts of Department of Defense spending in Missouri, essentially the procurement contracts to operate military facilities within the state consists of one portion of the impacts, while the remaining impacts are generated from direct personnel expenditures.

This analysis uses the well-known IMPLAN economic impact modeling process (see methodology section for a description). The IMPLAN economic impact analysis methodology considers all expenditures, visitor spending, retiree payroll, and contract spending with Missouri-based companies, taking into account the indirect economic impacts that spending has on the state. This analysis assumes that leakage of those contracts into and out of the state is equal. That is, those contracts that may be awarded to companies outside the state are equal to contracts that are awarded to companies inside the state from other state's military spending leaving a net zero effect.



One of the biggest benefits and economic impacts on the state are the jobs created by this investment of military spending. If we consider the impact of military spending as its own industry, it third highest in job creation among private industries for Missouri for FY15³, creating approximately 95,000 jobs, not counting the indirect jobs that resulted.

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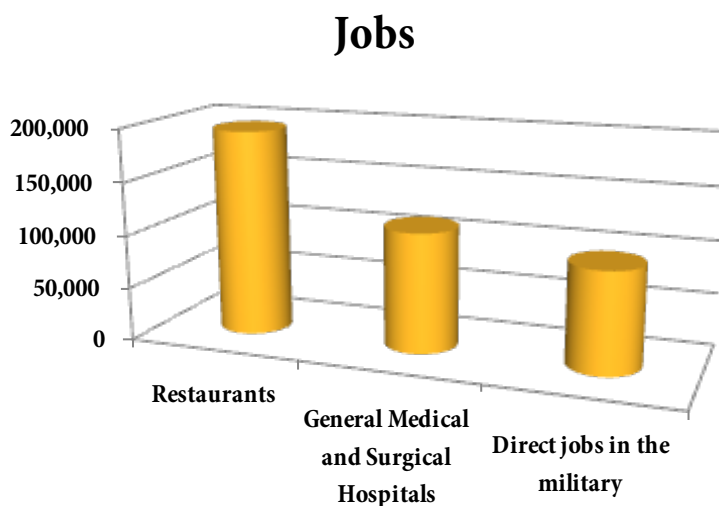
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Figure 2- Jobs created by Military Spending in Missouri FY15



3 Source: BLS 4 digit NAICS industry breakdown.

4 Source: BLS 4 digit NAICS industry breakdown.



Economic Impacts of Whiteman Air Force Base

From FY2013 to FY2015, Whiteman AFB directly hired an average of 7,639 personnel including over 2,000 civilian personnel. In total, Whiteman AFB spent an average of \$466.5 million to support its operations.

The 2015 “Wings over Whiteman” air show had a record 75,000 attendance resulting in a \$2.7 million impact on the region. Out-of-state visitors to Whiteman AFB for the Wings Over Whiteman (WOW) air show spent an average of \$1.9 million annually in the state, which resulted in more than \$2.7 million in total economic output, and supported approximately 36 jobs in the state.

Knob Noster school system, near Whiteman AFB, is a public school system that educates a significant number of military family children. They received \$4.7 million in Impact Aid in FY15 toward the cost of educating those children to offset the taxes that would have been collected from non-military families. Those funds supported the school budget, which in turn is used for payroll and operating expenses resulting in 535 jobs being created.

The total economic output of Whiteman AFB’s spending was \$855 million and supported 11,500 direct and indirect jobs in the state of Missouri. This includes both the base and air show economic impacts, but doesn’t include Impact Aid to schools.

Economic Impacts of Fort Leonard Wood

From FY2013 to FY2015, Fort Leonard Wood directly hired an average of 26,349 personnel, including over 7000 civilians. In total, Fort Leonard Wood spent an average of \$1.5 billion to support its operations. The total economic output of Fort Leonard Wood’s spending was over \$2.8 billion. The operation of Fort Leonard Wood supported more than 38,000 direct and indirect jobs in the state of Missouri.

Out-of-state visitors to Fort Leonard Wood spent an average of \$59 million annually, which resulted in over \$88 million in total economic output, and supported more than 1,000 jobs in the state.

Economic Impacts of Other Missouri Installations, Inactive Duty Personnel

The Department of Defense spent an average of \$728 million for personnel and operational expenditures at its minor installations in the state, the National Geospatial-Intelligence Agency, and for inactive military personnel (reserve units other than those tied to Whiteman or Ft Leonard Wood).

The total economic output from this combined spending was \$1.3 billion. This spending supported almost 15,000 direct and indirect jobs in the state.

Economic Impacts of the Missouri National Guard

The Missouri National Guard directly hired an average of 14,152 personnel and spent an average of \$605 million to support its operations in FY15. The total economic output of the Missouri National Guard's spending topped \$1 billion. The operation of the Missouri National Guard supported approximately 19,000 direct and indirect jobs in the state of Missouri.

Economic Impacts of Military Retirees

Pension payments for state residents who are military retirees averaged \$810 million annually FY13-15. The economic impact of that expenditure was over \$1 billion and over 7,600 jobs across the state. The retirees are spread across much of the state including many rural counties (see figure 16 for a map).

Economic Impacts of Contract Awards to Missouri-based Firms

From FY2013 to FY2015, the Department of Defense and Department of Energy awarded an average of \$9.8 billion in prime contracts to Missouri-based firms, which supported approximately 32,500 direct jobs in the state. The total indirect and direct jobs resulting from this investment by DoD and DoE is almost 91,000. The total economic output of DoD and DoE contract spending averaged \$25 billion per year from FY13-15.

In FY2015, 1186 different firms were awarded Department of Defense contracts in the state, but the largest awardees received the majority of the funds. In turn, they spent a lot of that with subcontractors in their supply chains, so the "ripple effect" was felt across many more firms in those supply chains throughout Missouri.

Out of the 3-year average of \$9.8 billion, \$9 out of every \$10 goes to the top 50 Missouri firms. Once those large firms receive those award dollars, most of those funds are used to buy goods and services from their supply chains in subcontracts and procurement, so there is a large ripple effect that affects many other supply chain members.



UNITED STATES AIR FORCE
Whiteman Air Force Base



Arnold Gate

Economic Impacts of Aid to Missouri School Districts

The state of Missouri received \$27.7 million in Impact Aid in FY15 for its school districts. The total economic output of Impact Aid in the state was \$47 million.

Impact Aid supported approximately 535 jobs in the state including an estimated 380 jobs for teachers, administrators, and other employees of Missouri school districts. For FY15, several school districts in Missouri received Impact Aid payments, totaling over \$21 million. Of those, two schools' systems received 98% of the funds; Waynesville and Knob Noster. Those school districts are closest to the two largest bases, Ft Leonard Wood and Whiteman AFB.

"Impact Aid" to schools is designed to provide for the costs of military families education to offset the lack of taxes school districts would normally collect from non-military families.

Chapter 3: Total Economic Impact of Military Spending in Missouri

Table 1- Overall Economic Impact of Military Spending in Missouri

Economic Contribution of Military Assets in Missouri, TOTAL

Total Military Spending	Output Multiplier	Output Total Impact	Total Jobs Impact	Total Labor Income	Total Value Added - GDP
\$14,097,668,268	2.28	\$32,182,370,837	183,727	\$10,331,721,029	\$13,824,688,696

Statewide Economic Impacts of Missouri DoD Contracts, TOTAL, 3-Year Ave. (FY13, FY14, FY15)

MO DoD Contracts Total Spending	Output Multiplier	Output Total Impact	Total Jobs Impact	Total Labor Income	Total Value Added - GDP
\$9,844,460,485	2.54	\$24,967,718,005	90,633	\$6,421,030,225	\$8,648,491,975

*Note: USAspending & OEA Reported averages, Boeing and Honeywell International company information

Economic Impacts of Whiteman AFB in Missouri, TOTAL, 3-Year Ave. (FY 13, FY14, FY15)

Whiteman AFB Total Base Spending	Output Multiplier	Output Total Impact	Total Jobs Impact	Total Labor Income	Total Value Added - GDP
\$466,509,734	1.83	\$855,041,370	11,473	\$514,354,077	\$622,447,646

Economic Impacts of Fort Leonard Wood in Missouri, TOTAL, 3-Year Ave. (FY 13, FY14, FY15)

Ft Leonard Wood Total Base Spending	Output Multiplier	Output Total Impact	Total Jobs Impact	Total Labor Income	Total Value Added - GDP
\$1,557,286,812	1.80	\$2,808,818,576	38,281	\$1,776,757,993	\$2,149,078,206

Statewide Economic Impacts of Missouri National Guard, TOTAL, FY15

MO National Guard Total Spending	Output Multiplier	Output Total Impact	Total Jobs Impact	Total Labor Income	Total Value Added - GDP
\$605,063,615	1.67	\$1,008,490,317	19,244	\$625,645,252	\$889,329,511

Economic Impacts of Other Military Assets* in Missouri, TOTAL, FY15

Other MO Assets Total Base Spending	Output Multiplier	Output Total Impact	Total Jobs Impact	Total Labor Income	Total Value Added - GDP
\$727,891,422	1.90	\$1,380,686,237	14,867	\$607,828,546	\$847,763,887

*Includes Reserves and Units stationed throughout Missouri; National Geospatial-Intelligence Agency

Statewide Economic Impacts of Missouri Military Retirees, TOTAL, 3-Year Ave. (FY13- FY15)

Military Retiree Total Spending	Output Multiplier	Output Total Impact	Total Jobs Impact	Total Labor Income	Total Value Added - GDP
\$809,524,000	1.27	\$1,026,563,782	7,623	\$325,636,620	\$582,117,028

*Based on 38,046 Retirees Receiving \$809.5M in Annual Gross Pay who Report their Mailing Address in the State of Missouri

Impact Aid to Schools in Missouri, TOTAL, FY15

Impact Aid Total Spending	Output Multiplier	Output Total Impact	Total Jobs Impact	Total Labor Income	Total Value Added - GDP
\$27,694,040	1.70	\$46,999,977	535	\$28,427,846	\$36,631,246

Economic Impacts of Military-Related Visitors Spending in Missouri, TOTAL

FLW Visitor Spending Total Spending	Output Multiplier	Output Total Impact	Total Jobs Impact	Total Labor Income	Total Value Added - GDP
\$59,238,160	1.49	\$88,052,573	1,071	\$32,040,470	\$48,829,197

*Based on Wings over Whiteman Air Show attendance 2015 and FLW data and expenses detailed in June 2013 MO Military Report



Section II

Economic Impacts from each Military Asset



Chapter 4 Economic Impact of Whiteman Air Force Base

Missouri is home to Fort Leonard Wood, Whiteman Air Force Base, the Missouri National Guard, and the Kansas City National Security Center at Honeywell as well as smaller locations throughout the state. Whiteman Air Force Base (Whiteman AFB) is located in Johnson County, Missouri just south of the city of Knob Noster about 70 miles southeast of Kansas City. It is a joint--service base that includes Air Force, Army, and Navy units.



The base's host unit is the U.S. Air Force's 509th Bomb Wing (509 BW) and the tenant units include the Missouri Air National Guard's 131st Bomb Wing (131 BW), the Air Force Reserve Command's 442nd Fighter Wing (442 FW), the Missouri

Army National Guard's 1/135th Aviation Battalion and the U.S. Navy Reserve's Mobile Inshore Undersea Warfare Unit 114. The B-2 Spirit stealth bomber uses Whiteman AFB as its only permanent base.

Including all military and civilian personnel, Whiteman averaged 7,639 direct jobs and \$468 million in spending to Missouri's economy (see table 3). While Whiteman is between Sedalia and Warrensburg in rural Missouri, its economic impact is distributed throughout a much larger area.

Table 2- Input for Economic Impact Analysis of Whiteman AFB

Whiteman AFB Inputs	
Personnel	7,639
Payroll	\$330,010,614
Operational Expenditures	\$136,499,120
Total Expenditures	\$466,509,734

Table 3- Economic Impact of Whiteman AFB

Economic Impacts of Whiteman AFB in Missouri, TOTAL			
Total Military Spending	Output Total Impact	Total Jobs Impact	Total Labor Income
\$468,402,894	\$857,779,901	11,509	\$515,389,216
Economic Impacts of Whiteman AFB in Missouri, TOTAL, 3-Year Ave. (FY 13-FY15)			
Whiteman AFB Total Base Spending	Output Total Impact	Total Jobs Impact	Total Labor Income
\$466,509,734	\$855,041,370	11,473	\$514,354,077

*Excludes \$6.43 million in Impact Aid to Schools (calculated separately for purposes of this report)

Economic Impacts of WoW Air Show, TOTAL, FY15			
WoW Air Show Total Spending	Output Total Impact	Total Jobs Impact	Total Labor Income
\$1,893,160	\$2,738,531	36	\$1,035,139

*Based on estimated 75,000 attendees in 2015, and attendee survey data and expenses detailed in June 2013 MO Military report

The estimated total economic impact of Whiteman is approximately \$857 million in total output and 11,509 jobs (7,639 direct).

Table 4- Input for Economic Impact Analysis of Ft. Leonard Wood

Ft Leonard Wood Inputs	
Personnel	26,349
Payroll	\$899,119,310
Operational Expenditures	\$342,095,928
Total Expenditures	\$1,241,215,238
Total Visitor Spending	\$57,345,000

Table 5- Economic Impact of Ft. Leonard Wood

Economic Impacts of Fort Leonard Wood in Missouri, TOTAL					
Total Military Spending	Output Multiplier	Output Total Impact	Total Jobs Impact	Total Labor Income	Total Value Added - GDP
\$1,614,631,812	1.79	\$2,894,132,618	39,316	\$1,807,763,324	\$2,196,393,261
Economic Impacts of Fort Leonard Wood in Missouri, TOTAL, 3-Year Ave. (FY13- FY15)					
Fort Leonard Wood Total Base Spending	Output Multiplier	Output Total Impact	Total Jobs Impact	Total Labor Income	Total Value Added - GDP
\$1,557,286,812	1.80	\$2,808,818,576	38,281	\$1,776,757,993	\$2,149,078,206
Economic Impacts of FLW Visitor Spending in Missouri (Based on FY12 Data)					
FLW Visitor Spending Total Spending	Output Multiplier	Output Total Impact	Total Jobs Impact	Total Labor Income	Total Value Added - GDP
\$57,345,000	1.49	\$85,314,042	1,035	\$31,005,331	\$47,315,055

Chapter 5: Economic Impact of Fort Leonard Wood Base

Fort Leonard Wood is located in Pulaski County, Missouri 92 miles northeast of Springfield and 138 miles southwest of St. Louis. It is a joint--service base that includes Air Force, Army, and Navy units. It is home to the Maneuver Support Center of Excellence and trains 40,000 to 50,000 military personnel and civilians annually, which includes training in engineering, chemical/biological, radiological/nuclear, military police, brigade special troops battalions, maneuver enhancement brigades, counter--improvised explosives device, and protection. As a major training facility, trainees come from all over the country.

Similar to Whiteman AFB and given its rural location, the vast majority of military and civilian personnel live on the base (active duty military) or in the nearby communities of Waynesville or elsewhere in Pulaski County. Trainees live on the base anywhere from two weeks to one year, but the vast majority have home addresses outside of Missouri. Though specific household income spending for those trainees while they're at the base cannot be tracked directly, we used survey results from the Plans, Analysis and Integration Office to calculate the portion of trainee payroll spent in Missouri⁵.

With the exception of these expenditures, we assume that all other household earnings are spent in the state of Missouri. Operational expenditures were assumed to be spent in the state.

Chapter 6: Economic Impact of ATK Lake City, Missouri Munitions Manufacturing Facility

Lake City Army Ammunition Plant (LCAAP) is a 3,935-acre U.S. government-owned, facility operated by Alliant Techsystems (ATK) has been in continuous operation since 1941. It was originally operated by Remington Arms and was tasked with manufacturing and testing small caliber ammunition for the U.S. Army. In 1985, Olin Corporation took over and later (2001) by ATK. For example, in 2007 the plant produced 1.4 billion rounds of small caliber ammunition.

ATK is an American defense, sporting goods, and aerospace company with headquarters in Arlington, VA with operations in 22 countries and over \$4.7 billion revenue in 2014. In April 2014, they spun off the sporting goods into Vista Outdoor and merge its defense and aerospace groups into Orbital ATK. In February 2015, the two entities commenced operations as separate companies. Orbital ATK has over 12,000 employees worldwide.

In 2012, the contract with DOD changed to allow ATK to produce commercial ammunition along with the military production. That allowed for a more stable production schedule and saved many jobs. That contract was a 5-year renewable contract and is the current contract under which the facility is operated.

The average (FY13-15) number of total jobs supported by LCAAP activities in Missouri was 5,641 with a total labor income of over \$303 million. The total economic impact of that facility is \$1.22 billion from defense contract expenditures of \$410 million average for FY13-15.





Chapter 7: Economic Impact of Other Military Assets

Missouri has other military assets benefit the state's economy over \$1.3 billion dollars annually. The Army and Navy Reserves hired over 6,000 people in FY15⁶. Much of the world's technology is dependent on geo-mapping and Missouri has a significant footprint in that space. Besides being near one of the offices of the international Garmin company, the University of Missouri has a strong GIS program in their College of Engineering. To that end, the Geospatial intelligence agency has a large presence in St Louis and is planning a large expansion, so this military asset promises to be an increasing economic benefit to the state's economy in the future.



Table 6- Economic Impact of Other Missouri Military Assets

Economic Impacts of Other Military Assets* in Missouri, FY15			
Total Military Spending	Output Total Impact	Total Jobs Impact	Total Labor Income
\$727,891,422	\$1,380,686,237	14,867	\$607,828,546
Economic Impacts of Combined Reserves in Missouri, TOTAL, 3-Year Ave. (FY 13-FY15)			
Combined Reserves Total Spending	Output Total Impact	Total Jobs Impact	Total Labor Income
\$121,236,221	\$222,141,861	7,192	\$146,901,872
*Includes Army and Navy Reserve Units stationed throughout Missouri			
Economic Impacts of NGIA, TOTAL, FY15			
NGIA Total Spending	Output Total Impact	Total Jobs Impact	Total Labor Income
\$606,655,201	\$1,158,544,376	7,675	\$460,926,674

Table 7- Input for Economic Impact Analysis of Missouri Army Reserves

Missouri Army Reserves Inputs	
Personnel	5,113
Payroll	\$85,235,521
Operational Expenditures	\$8,200,000
Total Expenditures	\$93,435,521

Table 8- Input for Economic Impact Analysis of Missouri Navy Reserves

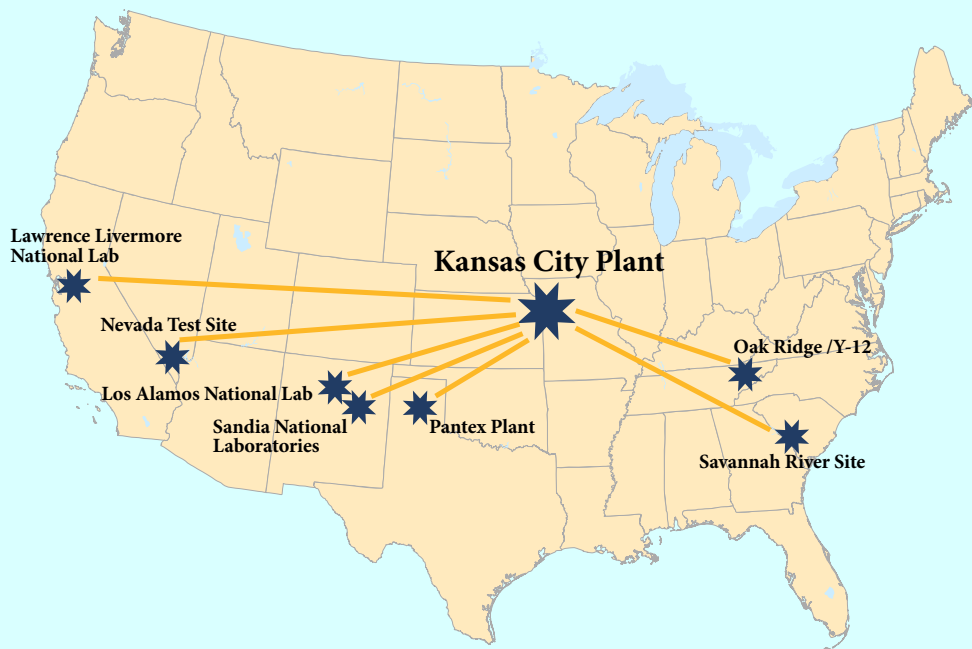
Missouri Navy Reserves Inputs	
Personnel	1,210
Payroll	\$22,747,186
Operational Expenditures	\$1,053,513
Total Expenditures	\$23,800,700

Chapter 8: Economic Impact of National Security Campus in Kansas City

The economic impact of the National Security Campus in Kansas City operated by Honeywell is over \$3.6 billion and almost 9,700 jobs to the state's economy for an investment of \$625 million in federal dollars. There were over 2,500 jobs created directly⁷ in FY15 averaged over \$97,000 each so are much higher than the average wage for Missouri.



The U.S. Nuclear Weapons Complex



⁷ Source: Integrated Supply Chain Office at NNSA Security Campus

Table 9- Economic Impact of National Security Campus in Kansas City

Economic Impacts of the National Security Campus in Kansas City, Missouri, TOTAL, 3-Year Ave. (FY13-FY15)			
Honeywell KC Total Spending	Output Total Impact	Total Jobs Impact	Total Labor Income
\$625,362,613	\$3,648,569,447	9,675	\$634,318,812



Table 10- Inputs for Economic Impact Analysis of National Security Campus in KC

National Security Campus Inputs	
Personnel	2,508
Payroll	\$236,022,152
Operational Expenditures	\$389,340,461
Total Expenditures	\$625,362,613

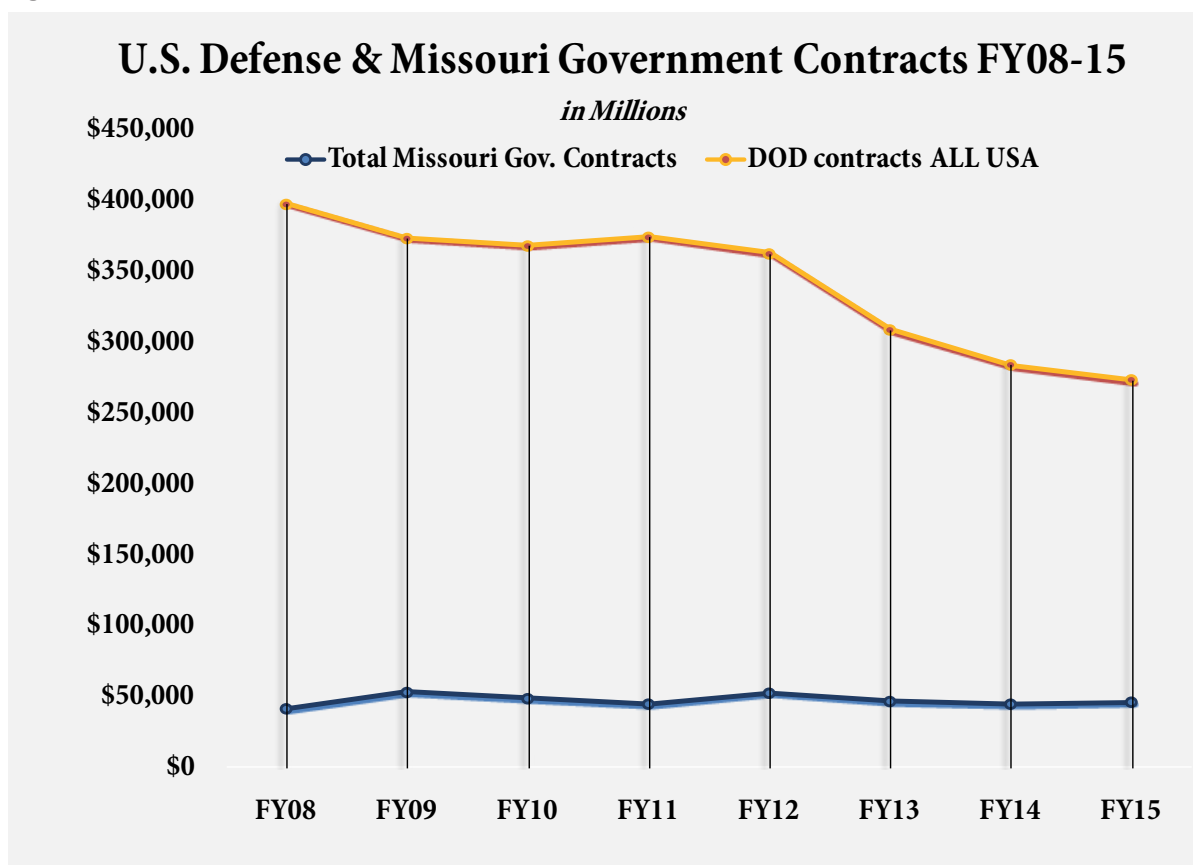


Chapter 9: Economic Impact of Military Contract Spending

Contract awards are the single biggest area of military spending in Missouri. From FY13-15 it averaged \$9.8 billion per year and resulted in over 90,000 jobs. Those contracts were awarded to Missouri-based companies who produced products and services for DoD and DoE. Many of them, in turn bought inputs from their supply chain in Missouri extending the “ripple effect” economic impact across the state. In the summary table (table 11), you can see that Boeing received a large percentage of the contract awards. This only accounts for prime awards and doesn’t take into account sub awards, so those supply chain companies that supply Boeing and other prime awardees benefit as well.

In understanding the role the federal government is having on Missouri’s economy via contract awards to Missouri-based companies, it is helpful to see the trend over the last eight years (see figure 3) for DoD contract awards nation-wide. The trend is downward, so the downtrend in Missouri contract awards (figure 4) is consistent with the national picture for defense spending⁸. According to DoD Office of Economic Adjustment (OEA), the projected spending for defense from 2011 to 2019 will be down 28%⁹.

Figure 3- All DoD Contracts Nationwide FY08-FY15



8 Sourced: Federal Procurement Data System (FPDS) via USASpending.gov, BRIDG

9 Source: OEA 2014 “Defense Spending by State” report, FPDS via USASpending.gov

Table 11- Economic Impact of DoD Contracts Awarded to Missouri Companies

Economic Impacts of Missouri DoD Contracts, 3- Year Avg. (FY13-FY15)

Total Military Spending	Output Total Impact	Total Jobs Impact	Total Labor Income
\$9,844,460,485	\$24,967,718,005	90,633	\$6,421,030,225

Economic Impacts of Boeing STL

Boeing STL Total Spending	Output Total Impact	Total Jobs Impact	Total Labor Income
\$6,532,978,723	\$16,709,907,378	52,644	\$4,403,332,801

*IMPLAN run with publicly reported jobs and company data as model inputs

Economic Impacts of Honeywell KC

Honeywell KC Total Spending	Output Total Impact	Total Jobs Impact	Total Labor Income
\$625,362,613	\$3,648,569,447	9,675	\$634,318,812

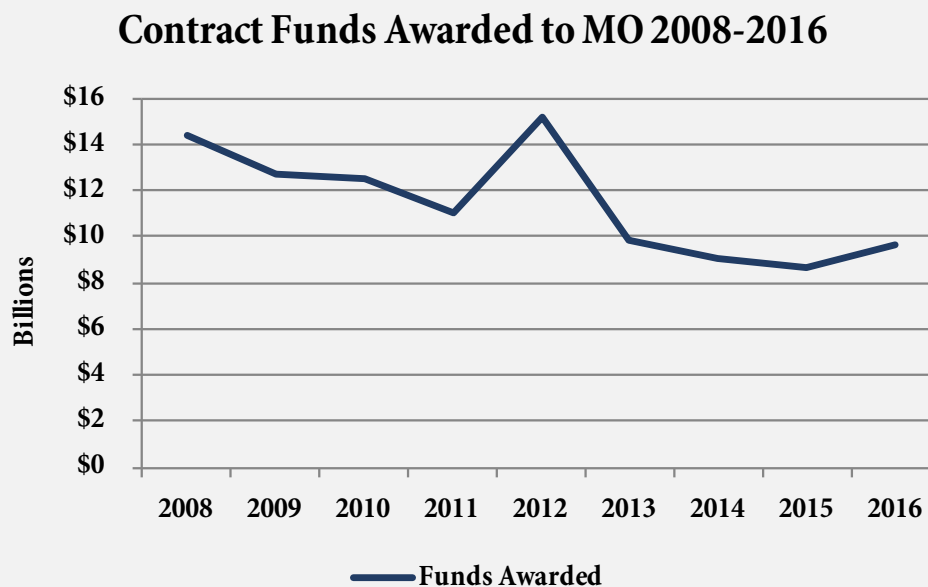
*IMPLAN run with actual jobs, gross payroll and operating expenses provided by company as model inputs

Economic Impacts of Other DoD Contracts

Balance DoD Contracts Total Spending	Output Total Impact	Total Jobs Impact	Total Labor Income
\$2,686,119,149	\$4,609,241,180	28,314	\$1,383,378,612

*Note: USAspending & OEA Reported averages, does not include Boeing and Honeywell International (calculated separately)

Figure 4- All DoD Contracts in Missouri FY08-FY16



How does Missouri Compare to Other States?

How does Missouri compare to other states in terms of military spending? In the 2014 OEA study, Missouri was ranked #12 in two categories. The states in table 12 are those states ranked ahead of Missouri in military spending by DoD. They're ranked in order of the change in spending from FY13 to FY 15. On the list, three states' spending increased, while all other states decreased. Maryland, Alabama, and Pennsylvania military spending went up, while Missouri received 11% less from DoD. The military spending cuts have been uneven across states.

Compared to the peer states in the OEA report, Missouri's decline in military spending between FY13 and FY15 has been a little more than the average. The total spending nationally declined 7.4%, while Missouri declined 11%. While the percentage difference between the U.S. overall decline and Missouri's decline, that translates to over \$500 million decline. Using the same multiplier for FY15 contract spending, that would result in over \$1.2 billion in economic impact for the state. Figure 5 illustrates the unevenness of the cuts¹⁰.

Percentage of a state's GDP is an important indicator of the importance of defense spending in any particular state. The top ten states in terms of the percentage of GDP accounted for by defense spending in the OEA 2014 report are included in table 13. Missouri was #12 on that list as well¹¹.



Table 12- Missouri Peer Group States Ranked by Defense Spending FY13-FY15

Peer Group States by Defense Spending Change FY13 to FY15				
STATE	FY13	FY14	FY15	Change FY13-15
Maryland	\$11,639,799,907	\$13,029,051,332	\$12,773,509,915	9.7%
Alabama	\$7,846,482,989	\$8,847,284,702	\$8,456,466,091	7.8%
Pennsylvania	\$9,966,443,223	\$10,161,125,320	\$10,305,409,895	3.4%
Florida	\$10,497,544,651	\$9,769,245,150	\$10,021,942,599	-4.5%
Georgia	\$5,461,297,767	\$6,302,238,370	\$5,107,629,236	-6.5%
Texas	\$32,313,763,374	\$23,902,999,452	\$29,500,245,757	-8.7%
California	\$33,950,378,217	\$30,899,507,726	\$30,620,679,722	-9.8%
Missouri	\$8,030,764,152	\$7,834,473,667	\$7,149,076,736	-11.0%
Massachusetts	\$10,637,134,887	\$9,458,369,437	\$9,457,367,282	-11.1%
Virginia	\$33,453,784,381	\$33,672,899,569	\$29,612,433,755	-11.5%
Washington	\$7,706,035,406	\$7,577,468,526	\$5,870,915,429	-23.8%
TOTAL SPENDING	\$171,503,428,954	\$161,454,663,251	\$158,875,676,417	-7.4%
source: USASpending.gov sept 2015 - contract awards from DOD for each state by FY				

10 Source: OEA 2014 study, FPDS via USASpending.gov, BRIDG

11 Source: OEA 2014 report

What do the contracts purchase?

The Department of Defense procures a wide range of goods and services from Missouri-based firms to support operations within the state, nationally, and internationally. In fact, Department of Defense spending encompassed almost 1200 companies and a wide variety of industries demonstrating the scale of impacts across nearly every industry in the state. These goods and services range from sophisticated aircraft and weaponry to food services and uniforms. In turn, the production of these contracted goods and services support other industries across the state creating jobs and economic prosperity.

These contracts do not exclusively support Missouri-based military or non-military installations; some installations from outside of Missouri procure goods and services from Missouri-based firms to support their operations; thus, Missouri uses these “out-of-state” Department of Defense dollars to export goods and services nationally and internationally. The data used to assess the economic impacts of these awarded contracts were obtained from the Federal Procurement Data System-- Next Generation (FPDS--NG) (using the USASpending.gov portal), which has provided all contract actions for Federal vendors since 1979.

In addition to what the DoD purchases, the Department of Energy contracts with Honeywell to operate the National Nuclear Security Campus in Kansas City where they manufacture and procure non-nuclear components for nuclear weapons. That operation spends between \$600 and \$700 million each year for payroll and operational costs. Their total economic impact for FY15 was \$3.6 billion and it supported over 9,600 jobs. The economic impact of DoE contract award dollars is discussed below under the section on the impact of contract awards.

Figure 6 illustrates the trend for the DoE military spending in Missouri for FY13-15. While it is a smaller expenditure, it has been increasing over the past three fiscal years.

Military contract funds flow through many parts of the regional economy and are not limited to “defense companies.” The top 10 defense industry products and services from FY13-15 by dollar value are listed below¹². Missouri’s top product is aircraft fixed wing manufacturing, which accounted for over 50% of all contracts from FY13-15. If we were to add in all the aircraft-related manufacturing contracts, the percentage of the total would be much higher.

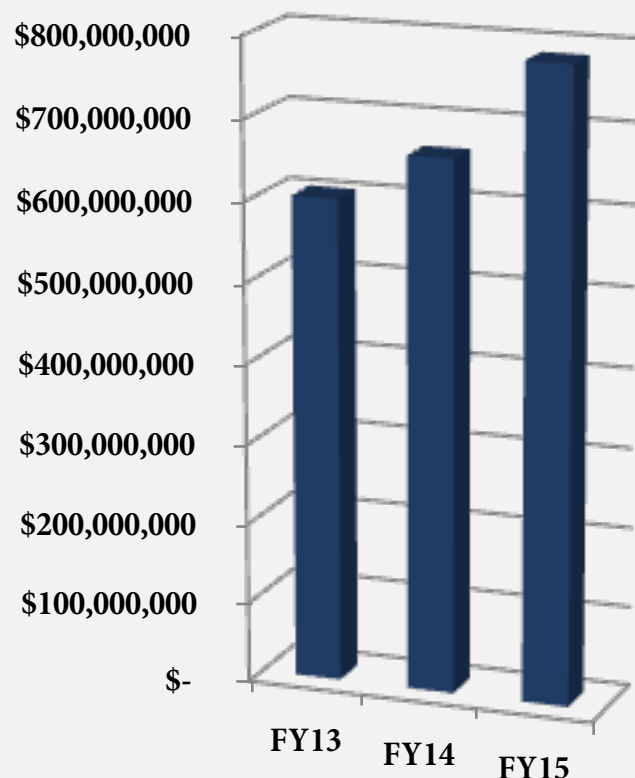
These sectors accounted for an average of 66% of the obligated contract dollars in FY13, 14 and 15. The total DoD contract awards for those three years were \$23,014,314,555¹³.

In addition to recognizing that the contracts cross many sectors of the economy, table 15 lists the top ten contractors¹⁴. Prime contracts typically are awarded to large contractors who, in turn, subcontract with small and medium sized companies that make up their supply chain.

Figure 5- DoE Contract Awards to MO Companies FY13-15

Total Awards Per Year FY13-15

■ Total Awards Per Year FY13-15



12 Source: FPDS via USASpending.gov September 2016. BRIDG, CREC

13 Source: FPDS via USASpending.gov summary of DoD contract awards by state September 25, 2016.

14 Source: OEA 2014 report, FPDC via USASpending.gov, BRIDG

15 Source: FPDC via USASpending.gov, BRIDG

Ninety one percent of the prime contract awards for Missouri went to the top ten awardees. However, to put this in perspective, while they were the “prime” award winners, they in turn, typically subcontract with many other companies in Missouri in order to complete the contract. Because those subcontractors aren’t tracked as closely as the prime awards, no quantitative analysis can account for the supply chains of subcontractors who end up benefitting from the contracts. In FY15 there were almost 1,200 companies who won prime contract awards. There would be many more who were subcontractors on those awards.

Nation-wide, Boeing is one of the biggest defense contractors. For FY15, Boeing was the third largest contractor for DoD behind Lockheed Martin and Raytheon receiving 15% of all DoD contracts nationwide¹⁵.

Figure 6- Missouri Peer Group States Ranked by Defense Spending Changes FY13-15

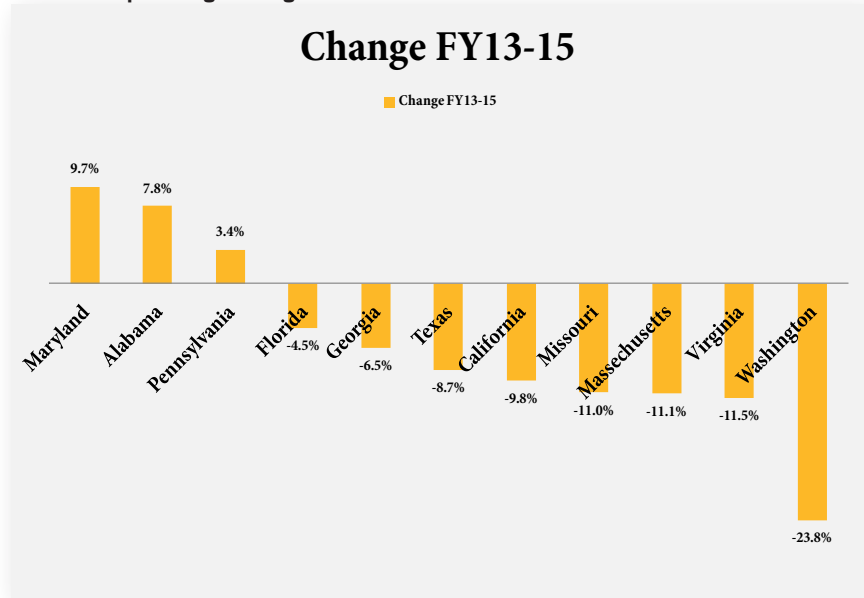


Table 13-Missouri Peer Group States by Defense Spending as a Portion of the State GDP FY14

Highest Defense Spending as a % of State GDP FY14	
STATE	% of State GDP FY14
Virginia	11.8%
Hawaii	9.9%
Alabama	5.9%
District of Columbia	5.8%
Maryland	5.7%
Alaska	5.7%
Mississippi	5.1%
Kentucky	4.9%
Maine	4.4%
Arizona	4.0%
Conneticut	3.9%
Missouri	3.9%



Table 14- Missouri DoD Contract Awards by Industry Sectors from FY13-FY15

Sector	Total contract amount FY13-15
Aircraft, Fixed Wing Manufacturing	\$9,305,890,153
Medical-Other	\$1,644,267,133
Miscellaneous Aircraft Accessories and Components Manufacturing or Procuring	\$1,000,174,778
Ammunition, through 30MM Manufacturing or Procuring	\$930,921,279
Airframe Structural Components Manufacturing or Procuring	\$786,485,891
Bombs Manufacturing or Procuring	\$614,656,891
Maint/Repair/Rebuild of Equipment- Aircraft Components and Accessories	\$420,110,537
Modification of Equipment- Aircraft Components and Accessories	\$313,512,133
Construction of Hospitals and Infirmaries	\$313,132,230
Meat, Poultry, and Fish	\$256,242,455

Figure 7- The 10 Biggest Industry Sectors

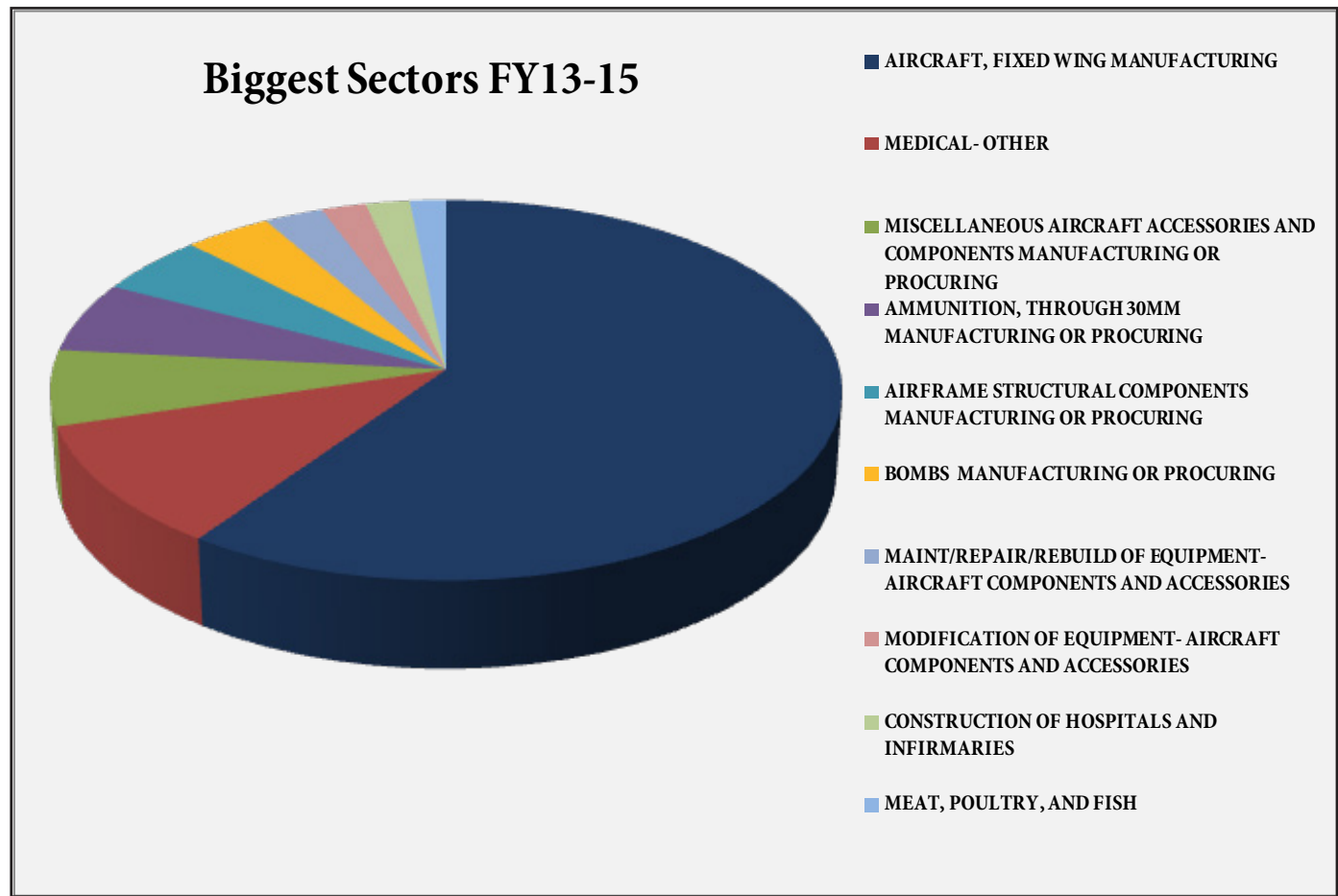


Table 15- Top 10 Missouri Contractors

Top 10 Contract Awardees in Missouri			
FY14			
Company	Amount	Percent of Total Awards	Input Amount
Boeing	\$6,900,000,000	73.40%	\$6,532,978,723
Express Scripts	\$671,000,000	7.10%	\$635,308,511
Alliant Techsystems	\$413,400,000	4.40%	\$391,410,638
World Wide Technologies	\$164,200,000	1.70%	\$155,465,957
Finmeccanica	\$129,200,000	1.40%	\$122,327,660
U.S. Premium Beef	\$126,100,000	1.30%	\$119,392,553
Graybar	\$69,800,000	0.70%	\$66,087,234
Computer Sciences Corporation	\$58,400,000	0.60%	\$55,293,617
EnerSys	\$46,500,000	0.50%	\$44,026,596
Honeywell International	\$43,200,000	0.50%	\$40,902,128
Top 10 Total	\$8,621,800,000	91.70%	\$8,163,193,617
Remaining Total	\$778,200,000	8.30%	\$736,806,383
Other Manufacturing	\$544,740,000		\$515,764,468
Other Services	\$233,460,000		\$221,041,915

Figure 8- Top 10 Contractors Share of Awards for FY15

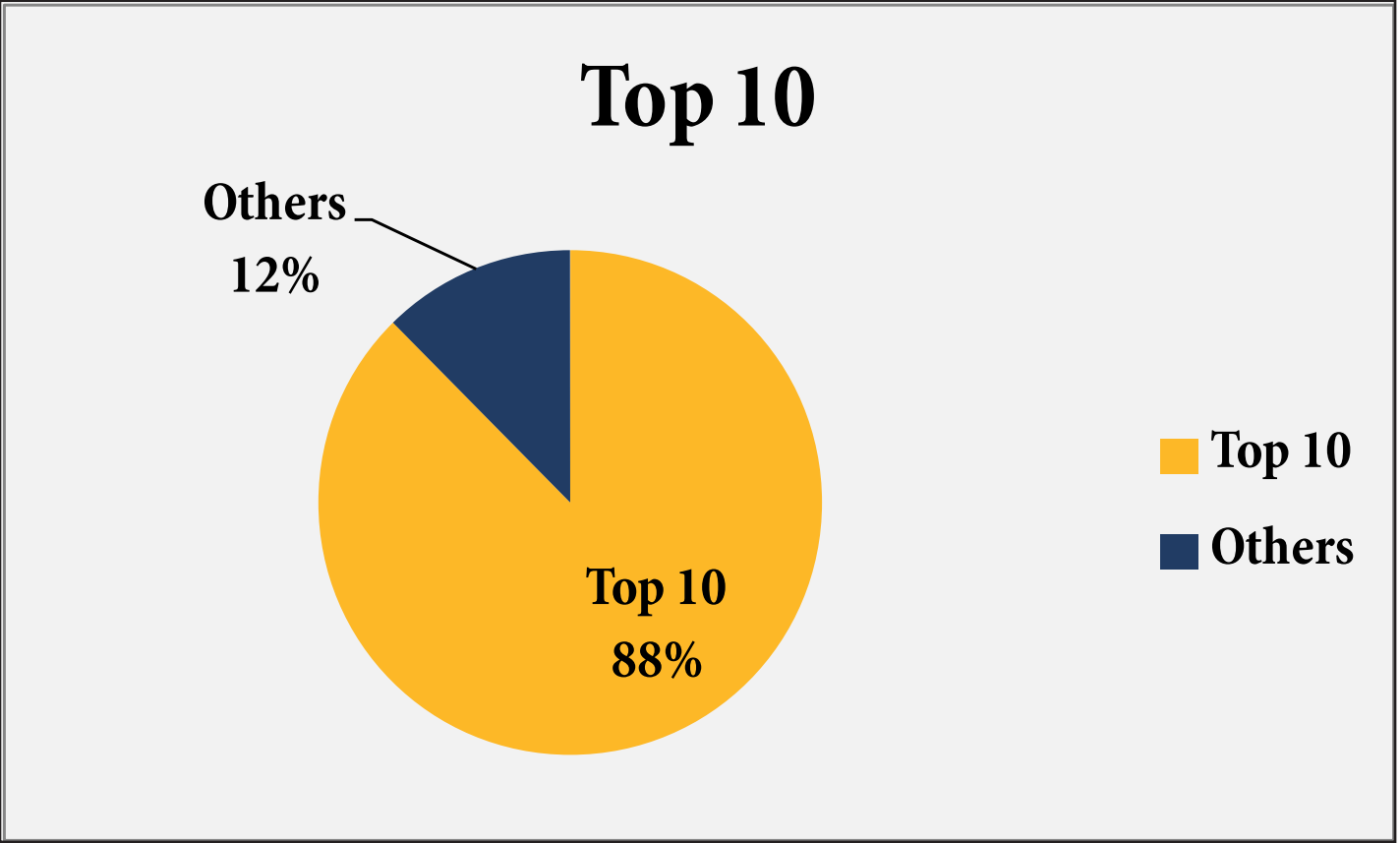


Figure 9- Top 10 DoD Contractors Nationally

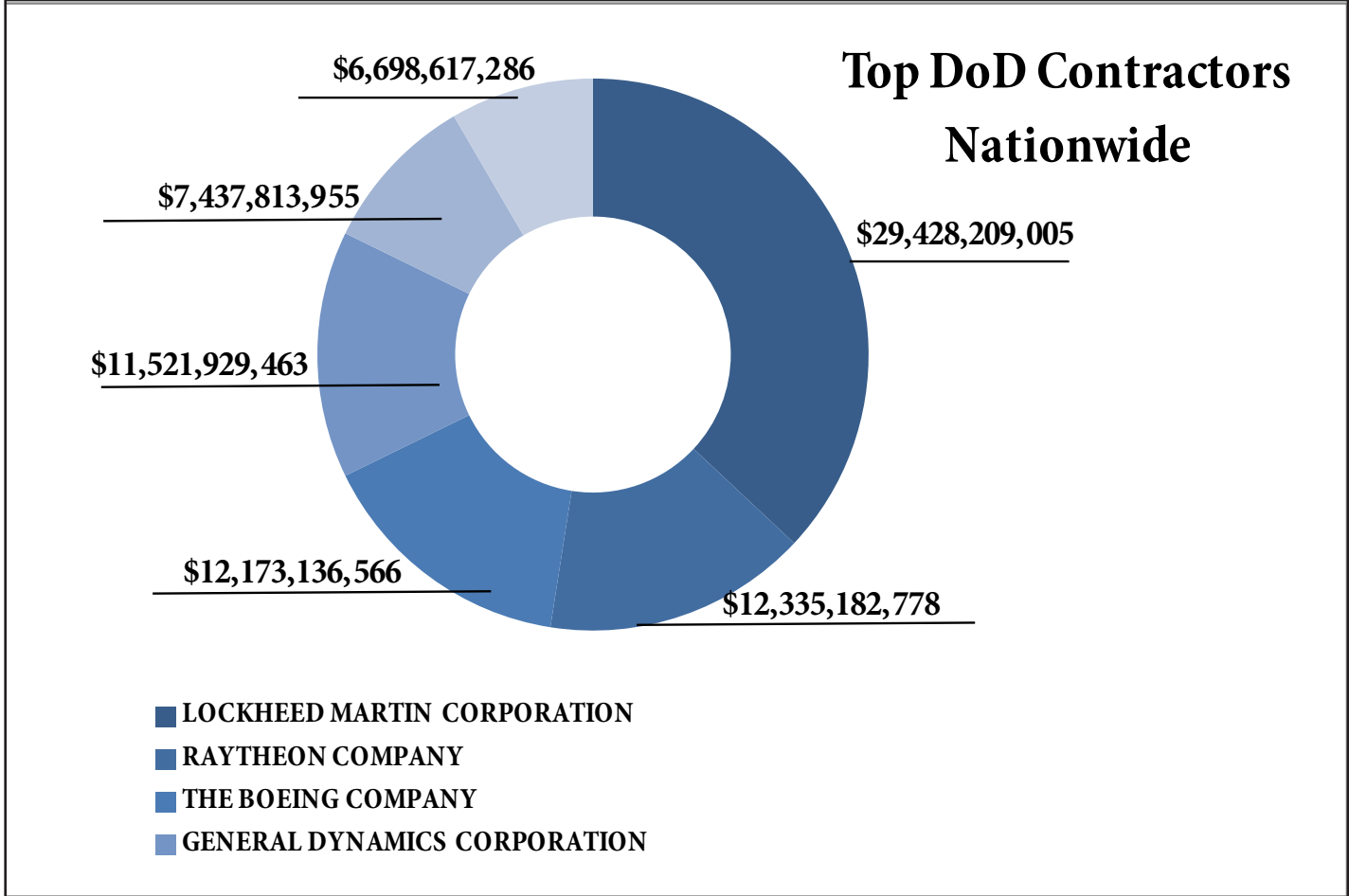
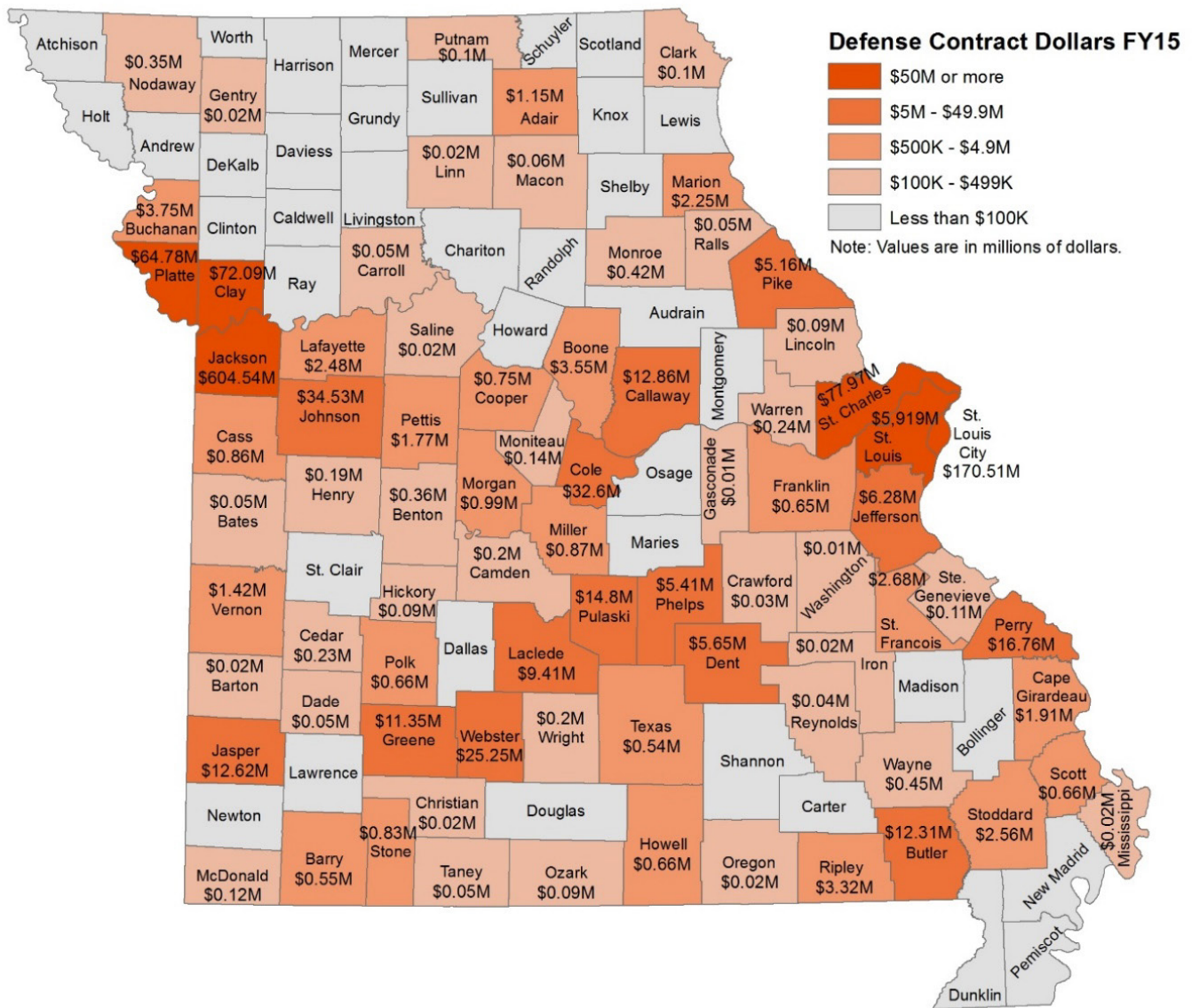


Figure 10- DoD Contract Awards by County FY15



Where does the contract spending go in the state?

The map above (Figure 10) provides a visualization of the economic impact of DoD contract spending in the state. You'll notice that even though much of the spending is in urban areas, there are rural areas that receive a lot of contract awards as well, spreading the economic impact across the state. For example, Perry county received over \$16 million and Butler over \$12 million¹⁶.

¹⁶ Source: FPDS via USASpending.gov, MERIC

Chapter 10: Economic Impact of Research Contracts in Missouri

Research awards are an important part of the contract spending because it supports basic research, often connected to research universities and brings with it a lot of downstream benefits in the form of product development and commercialization that would not be possible without funding for the basic research to develop the technology that later becomes products and services. In addition, those funds support the educational environment for Missouri's students via their connection to the universities that participate in those research contracts. Other economic benefits can include the clustering

effect of companies that start or move to a place where research and development is being done for business purposes and a business community that often relies on this type of funding to produce the new technology they can't afford to invest in individually. Companies that commercialize new technology often resist investing in a new technology until it reaches a point in its development where the product is ready to scale and the customer base is known. Previous to that, in the pre-revenue and even the pre-minimum-viable-product stage, it is difficult for companies to devote resources to that stage of R&D, so many companies today don't have nearly as much R&D capacity as large corporations once did.

Figure 11-DoD Research Contracts in Missouri FY13- FY15

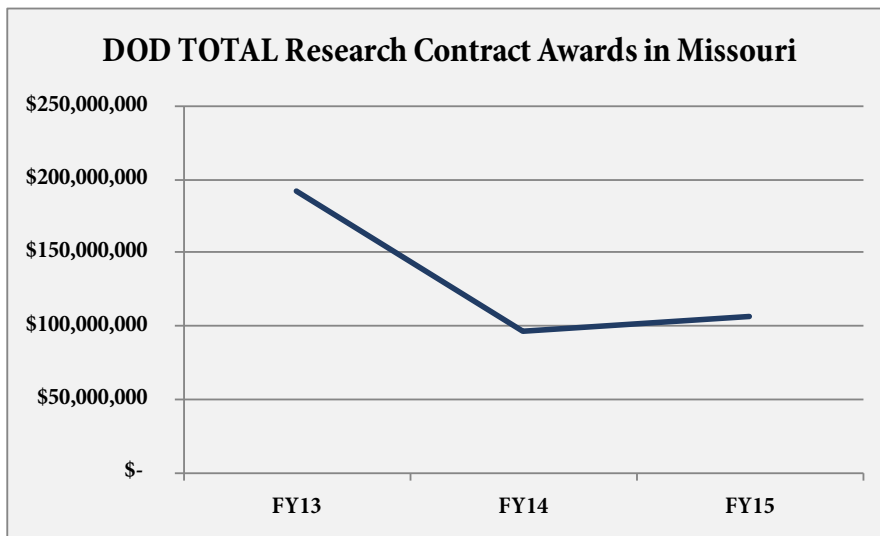
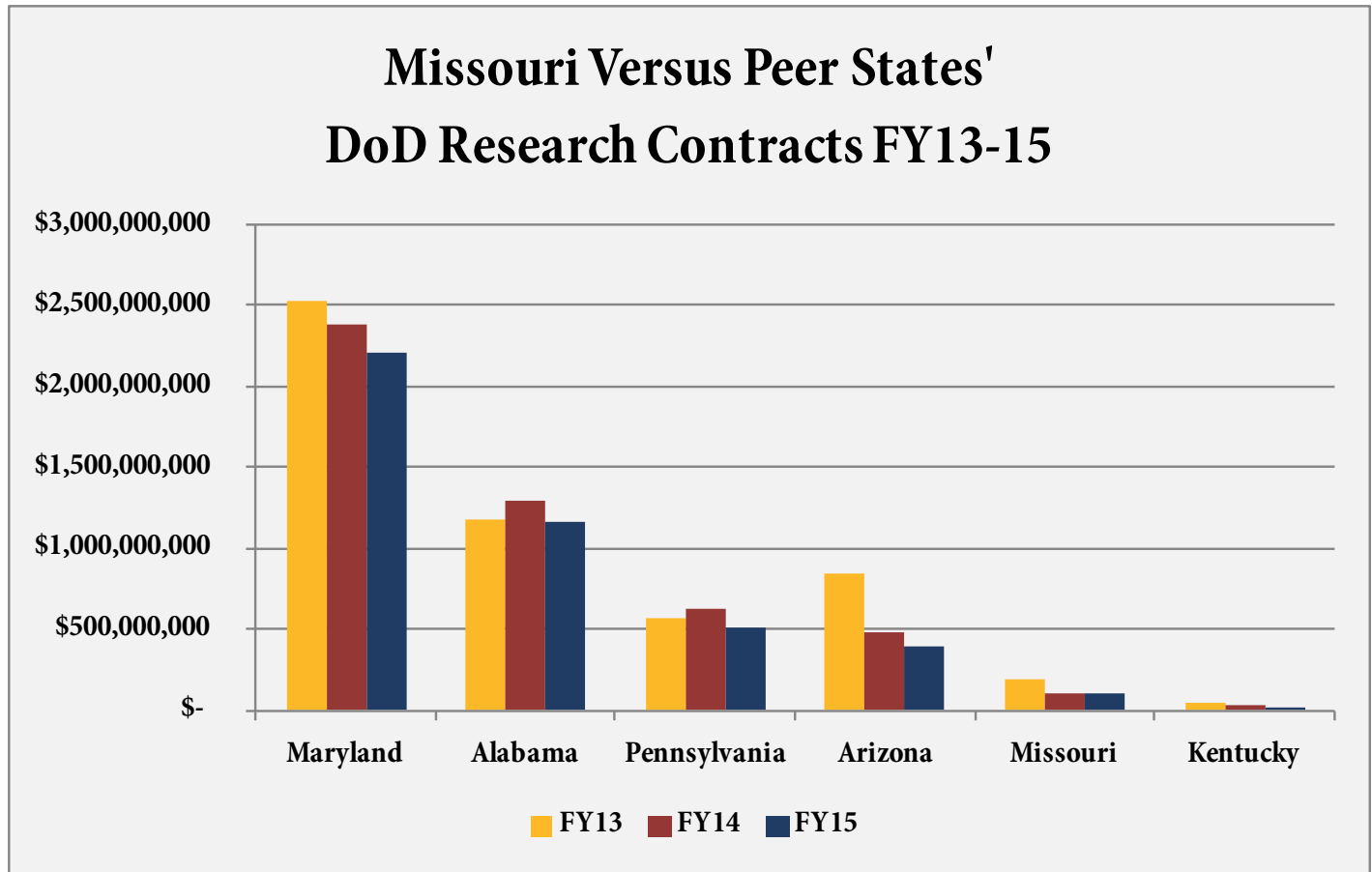


Figure 12- Missouri Versus Peer States' DoD Research Contracts FY13-15



The trend for research contracts in Missouri, like overall military spending, has been down over the past three fiscal years. Figure 10 illustrates that trend.

In 2014 OEA's study, Missouri ranked #12 in both total DoD spending in the state and in % GDP that spending represented. From that analysis, we created a set of peer states from those two top ten rankings to benchmark Missouri to. We used a sample of the only three states with increased spending and two states whose percentage of state GDP was similar to Missouri as a set of comparison peer states. We then looked at DoD research contract awards for those states. Figure 11 shows how Missouri compared from FY13-15. While total DoD contract dollars were up in some states and down in others, the research contract awards were down almost across the board.

The percentage of change in DoD research contracts was uneven. Of the OEA comparison states, Missouri had the third largest amount of decrease in research funding from FY13 to FY15. Figure 12 illustrates the comparison of those levels of change.





Figure 13- Missouri Versus peer States by Change in DoD Research Spending FY13-15

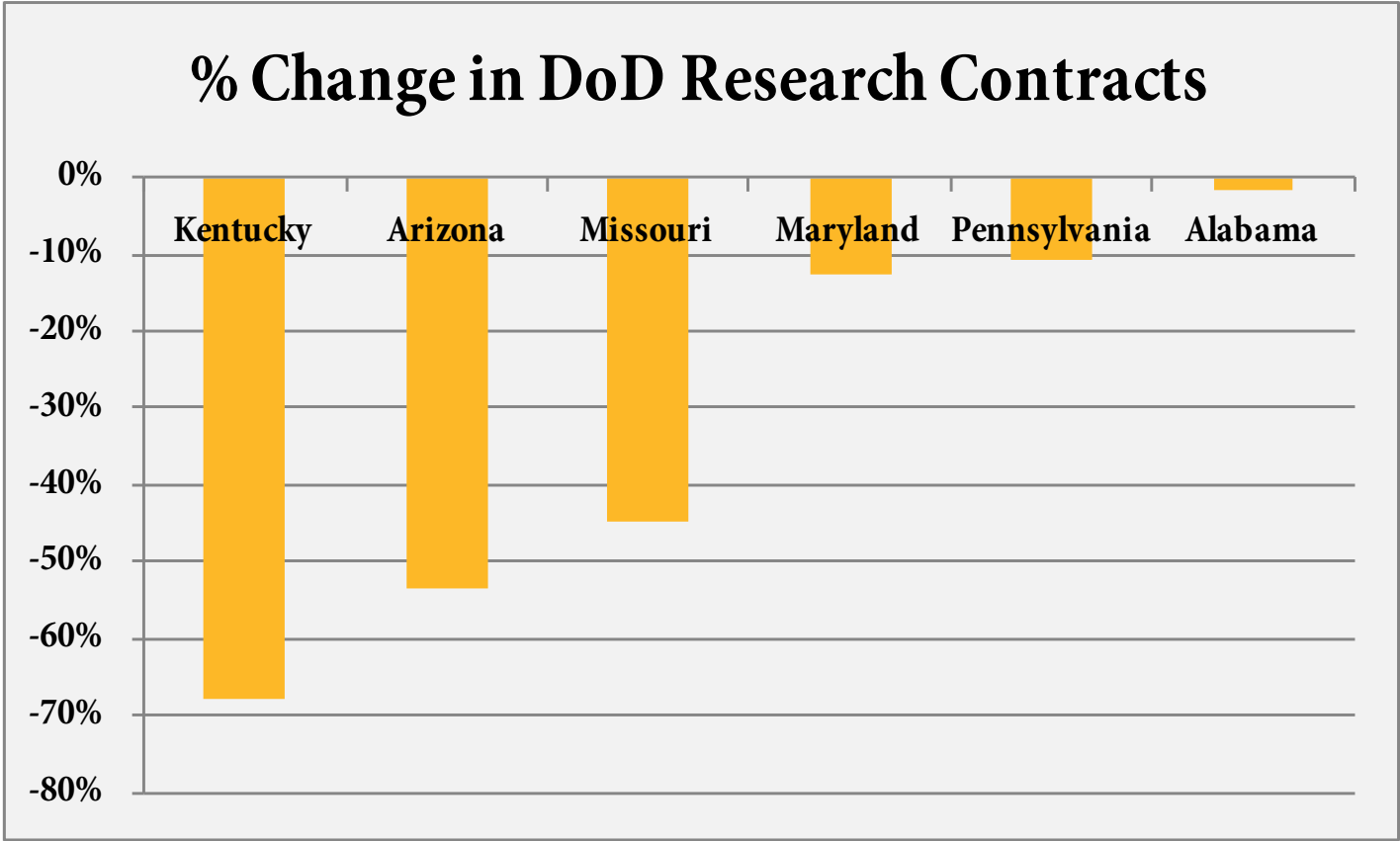
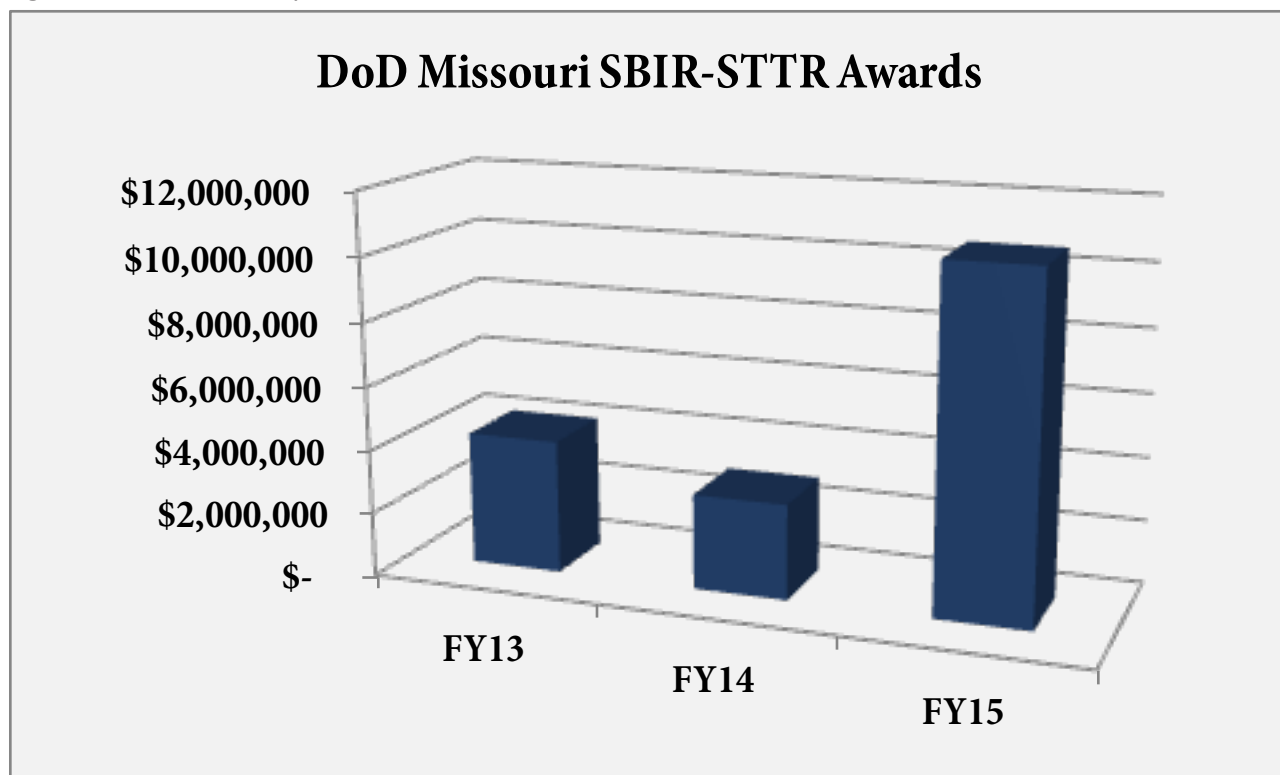


Figure 14- Missouri SBIR/STTR Research Awards Alone FY13-15



One of the most important components in research investments that bolster economic development for any region are its investments in early stage technology research, commercialization, and business development of what can often be high-growth high-potential businesses. When a new technology is developed, there are periods in its development that are typically hard to fund. Those early stages where the viability of the technology is still a major question are hard to find investors for. That is, during the prototyping, testing, and early product development, the business is typically not generating revenue and success once it is developed is not at all certain.

Venture capital tends to want to invest at a later stage, where the product/technology is developed, tested in the marketplace and is ready for scaling. Even angel investors tend to want a technology developed beyond the early stages. That's where investment capital to develop the prototype, test it, create a minimum viable product and take it to the marketplace for feedback needs investment from public sources such as the SBIR/STTR grants. Figure 13 shows the level of funding for research and development for FY13-15 in Missouri by DoD, which is another way military spending helps Missouri's economy.

SBIR/STTR awards come from several different agencies, which are mandated to allocate a portion of their funds to this program. Given the role and importance of SBIR/STTR funding to high tech, high potential companies startups and expansions to a state's economy, it's important to know how Missouri fares in terms of the amount they receive compared to other states. Since states differ in terms of population, this analysis includes both the three-year total for FY13-15 and a per capita analysis. You'll notice in table 17 that Missouri ranks 40th in SBIR/STTR funding per capita over the past three fiscal years.



Table 16- Ranking of SBIR/STTR Research Contract Awards - ALL Agencies FY13-FY15

Rank	State	3 year totals SBIR/STTR All Agencies	State Population fy15*	Per Capita 3 year avg
1	Massachusetts	\$798,262,216	6,794,422	117.49
2	New Hampshire	\$126,822,193	1,330,608	95.31
3	Connecticut	\$275,034,732	3,590,886	76.59
4	Maryland	\$345,720,655	6,006,401	57.56
5	Alabama	\$141,039,509	2,978,204	47.36
6	Virginia	\$373,807,781	8,382,993	44.59
7	New Mexico	\$84,947,923	2,085,109	40.74
8	California	\$1,432,967,621	39,144,818	36.61
9	Delaware	\$31,782,943	945,934	33.60
10	Montana	\$33,741,201	1,032,949	32.66
11	Vermont	\$19,090,116	626,042	30.49
12	Utah	\$80,736,967	2,995,919	26.95
13	Oregon	\$100,129,654	4,028,977	24.85
14	Pennsylvania	\$271,755,936	12,802,503	21.23
15	Ohio	\$242,818,977	11,613,423	20.91
16	Rhode Island	\$18,972,924	1,056,298	17.96
17	North Carolina	\$177,462,891	10,042,802	17.67
18	Minnesota	\$94,996,237	5,489,594	17.30
19	Hawaii	\$24,431,633	1,431,603	17.07
20	Washington	\$122,276,557	7,170,351	17.05
21	New Jersey	\$144,444,027	8,958,013	16.12
22	Colorado	\$87,964,391	5,456,574	16.12
23	Michigan	\$159,027,918	9,922,576	16.03
24	Arizona	\$109,010,944	6,828,065	15.97
25	New York	\$307,276,245	19,795,791	15.52
26	District of Columbia	\$10,106,018	672,228	15.03
27	Wisconsin	\$75,153,351	5,771,337	13.02
28	Kentucky	\$52,692,131	4,425,092	11.91
29	Wyoming	\$6,395,811	586,107	10.91
30	Indiana	\$72,157,303	6,619,680	10.90
31	Texas	\$291,148,559	27,469,114	10.60
32	Illinois	\$135,679,951	12,859,995	10.55
33	Georgia	\$99,399,361	10,214,860	9.73
34	Florida	\$187,906,247	20,271,272	9.27
35	Kansas	\$23,772,658	2,911,641	8.16
36	Iowa	\$23,858,602	3,123,899	7.64
37	South Carolina	\$34,224,695	4,896,146	6.99
38	South Dakota	\$5,669,032	858,469	6.60
39	Maine	\$8,627,209	1,329,328	6.49
40	Missouri	\$38,317,070	6,083,672	6.30
41	Nevada	\$18,060,800	2,890,845	6.25
42	Tennessee	\$40,795,346	6,600,299	6.18

43	Oklahoma	\$22,725,930	3,911,338	5.81
44	Nebraska	\$8,779,716	1,896,190	4.63
45	Idaho	\$7,126,865	1,654,930	4.31
46	Arkansas	\$20,287,490	4,858,979	4.18
47	North Dakota	\$2,839,681	756,927	3.75
48	West Virginia	\$5,990,732	1,844,128	3.25
49	Alaska	\$1,891,186	738,432	2.56
50	Louisiana	\$11,056,250	4,670,724	2.37
51	Mississippi	\$2,789,115	2,992,333	0.93
52	Puerto Rico	\$329,780	3,474,182	0.09

*Source: Census bureau



Chapter 11: Economic Impact of Cutbacks in Defense Spending in Missouri

Recently DoD-OEA commissioned a study of the economic impact of the discontinuation of three military airframes built by Boeing in St. Louis. The three airframes are the C -17 Globemaster, F/A-18 and E/A-18, and the F-15. The C-17 was discontinued in 2015 and the other two are scheduled to be discontinued in the next two years. The estimated annual contract value of F-15 and F/A-18 procurement for 2016 is expected to be \$4.2 billion, of which \$2.2 billion is estimated to be captured by St. Louis area defense contractors supporting about 11,000 jobs.

The study¹⁷ described the situation thus: “Beginning In the fall of 2014, the St. Louis Economic Development Partnership embarked on a well-worn path, one first taken by the St. Louis County Economic Council in the early 1990s, initiating conversations with the Department of Defense (DoD), Office of Economic Adjustment to acknowledge and respond to economic challenges caused by defense adjustment. Beginning indirectly in 1979 with the end of F-4 Phantom II production and more directly between 1990 and 1993, the St. Louis Region lost roughly 16,000 jobs at McDonnell Douglas as the Cold War came to an end. Policy responses at that time, focused on export assistance, job training, business incubation and expanded equity for new business formation, all proved to be strategic for the Region.

So as the Region now moves into 2016, it faces a very similar challenge of defense adjustment and regional diversification, in this case linked to concern over dependence on DoD aerospace manufacturing linked to final assembly of the F/A-18, the E/A-18, and the F-15, three programs that, like the F-4 Phantom II back in 1979, are now poised to gradually transition out of core military use in coming years.”

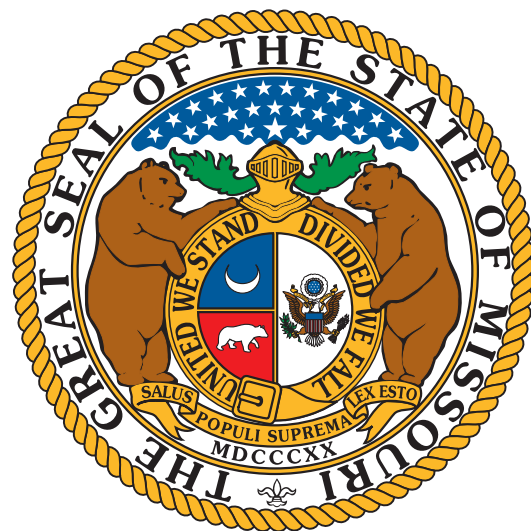


Table 17- Economic Impact of Missouri National Guard

Total Military Spending	Output Total Impact	Total Jobs Impact	Total Labor Income
\$605,063,615	\$1,008,490,317	19,244	\$625,645,252

Table 18- Input for Economic Impact Analysis of Missouri National Guard

Missouri National Guard Inputs	
Personnel	11,844
Payroll	\$371,946,149
Operational Expenditures	\$233,117,466
Total Expenditures	\$605,063,615

17 Source: AECOM study commissioned by OEA for the RAMP group in St. Louis

18 Source: Missouri National Guard Adjutant General's Office



Chapter 12: Economic Impact of Missouri National Guard

The Missouri National Guard includes the Missouri Army National Guard and Missouri Air National Guard and operates installations and stations personnel throughout the state. The Missouri National Guard headquarters is located at the Ike Skelton Training Site in Jefferson City, Missouri. The largest proportion of personnel is stationed at the headquarters in Jefferson City, but there is also a major presence at Whiteman AFB, Jefferson Barracks in St. Louis, Rosecrans in St. Joseph, and the Army National Guard in Springfield.

With personnel scattered across the state, the National Guard's economic impact is less localized and is distributed throughout the state; therefore, the primary impacts are from its personnel living in the state. Since the Missouri National Guard is part of the United States National Guard and Missouri Department of Public Safety, not all of its funding is through the Department of Defense; it receives some of its funding through the state of Missouri, but the specific breakdown of state and federal funds is unavailable. Therefore, for the purposes of conducting the economic impact analysis, its entire annual spending was considered.

The Missouri National Guard is a large expenditure and has a large economic impact on the state's economy (see table 18) of over \$1 billion, almost 12,000 direct jobs¹⁸ and over 19,000 indirect jobs for an investment by DoD of \$605 million.



Chapter 13: Economic Impact of Retiree Spending

Missouri attracts a sizeable number of military retirees who receive direct payments from the Department of Defense. Approximately 38,000 retirees who report their mailing address in Missouri received a total of nearly \$809 million on average in FY13, 14, and 15. This income spent in the region supports a variety of household, personal services, leisure, and hospitality activities and contributes to the tax base. Table 20 summarizes the total economic impact of military retirees living in Missouri both for FY15 alone and for the FY13-15 average¹⁹.

This figure may understate the impact of retiree spending since retirees who live in nearby communities in bordering states but visit Missouri to take advantage of shopping, recreational, tourism and healthcare resources are not included.



¹⁹ Source: Department of Defense Military Pay File, FY2015

Table 19-Economic Impact of Military Retiree Spending in Missouri

Economic Impacts of Missouri Military Retirees 3-Year Ave. (FY13, FY14, FY15)			
Military Retiree Total Spending	Output Total Impact	Total Jobs Impact	Total Labor Income
\$809,524,000	\$1,026,563,782	7,623	\$325,636,620
*Based on 38,046 Retirees Receiving \$809.5M in Annual Gross Pay who Report their Mailing Address in the State of Missouri			
Statewide Economic Impacts of Missouri Military Retirees, FY15			
Military Retiree Total Spending	Output Total Impact	Total Jobs Impact	Total Labor Income
\$827,124,000	\$1,048,852,046	7,789	\$332,706,687
*Based on 38,415 Retirees Receiving \$827.1M in Annual Gross Pay who Report their Mailing Address in the State of Missouri			

Table 20- Input for Economic Impact Analysis of Military Retiree Spending in Missouri

DOD	Number Retired (MO)	Monthly Payment (000s)	Yearly Payments
FY13 - as of September 30, 2013	37,677	\$66,059	\$792,708,000
FY14 - as of September 30, 2014	38,045	\$67,395	\$808,740,000
FY15 - as of September 30, 2015	38,415	\$68,927	\$827,124,000
3-Year Average (FY13, FY14, FY15)	38,046	\$67,460	\$809,524,000

The number and incomes of military retirees living in Missouri trended upward in FY13, 14, and 15 (see figures 14 and 15). That means more military personnel find Missouri a good place to retire and they have increasing amounts of income to spend in the state which increases their economic impact in Missouri.

Figure 15- Average Annual Military Retirement Income in Missouri FY13-15

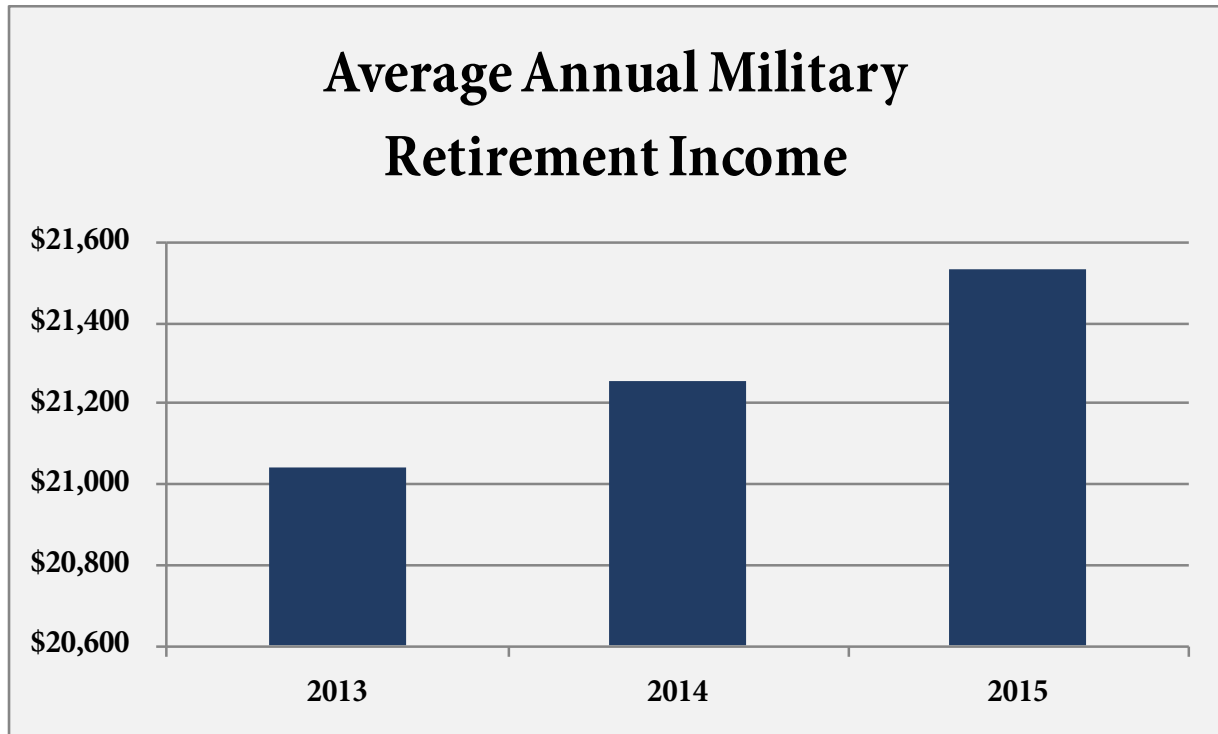


Figure 16- Number of Military Retirees Living in Missouri FY13-15

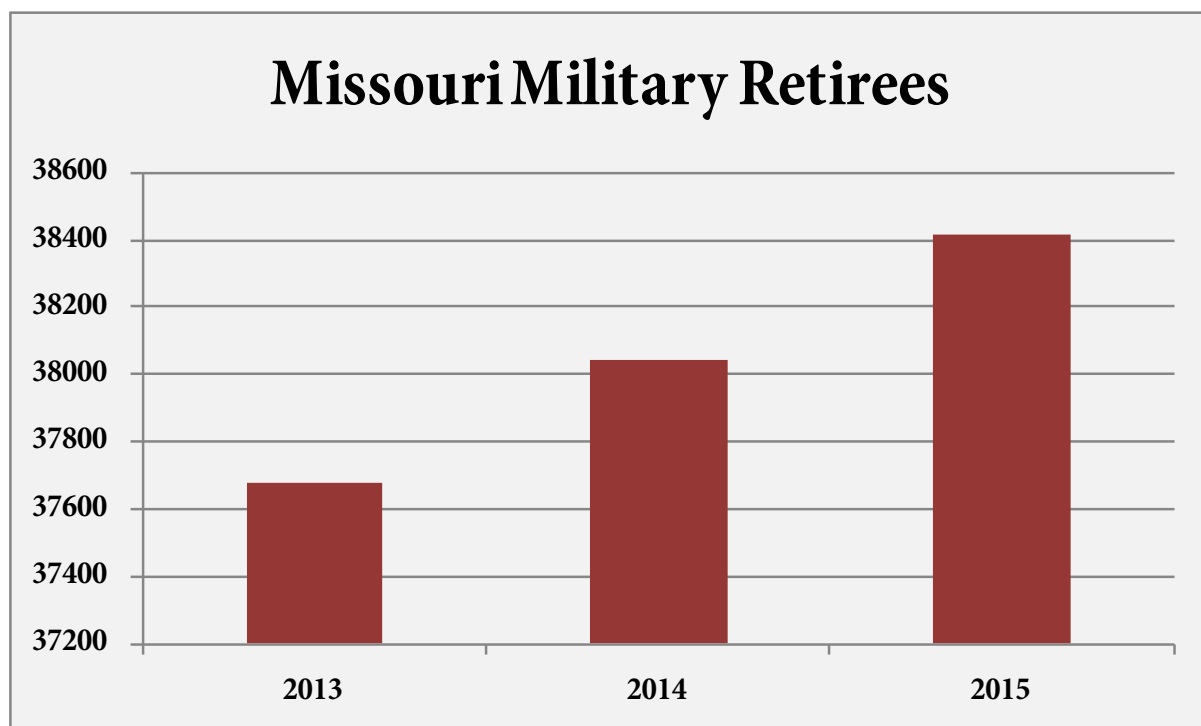


Figure 17- Total Amount of Military Retiree Pay by 3-digit Zip Code in Missouri FY15

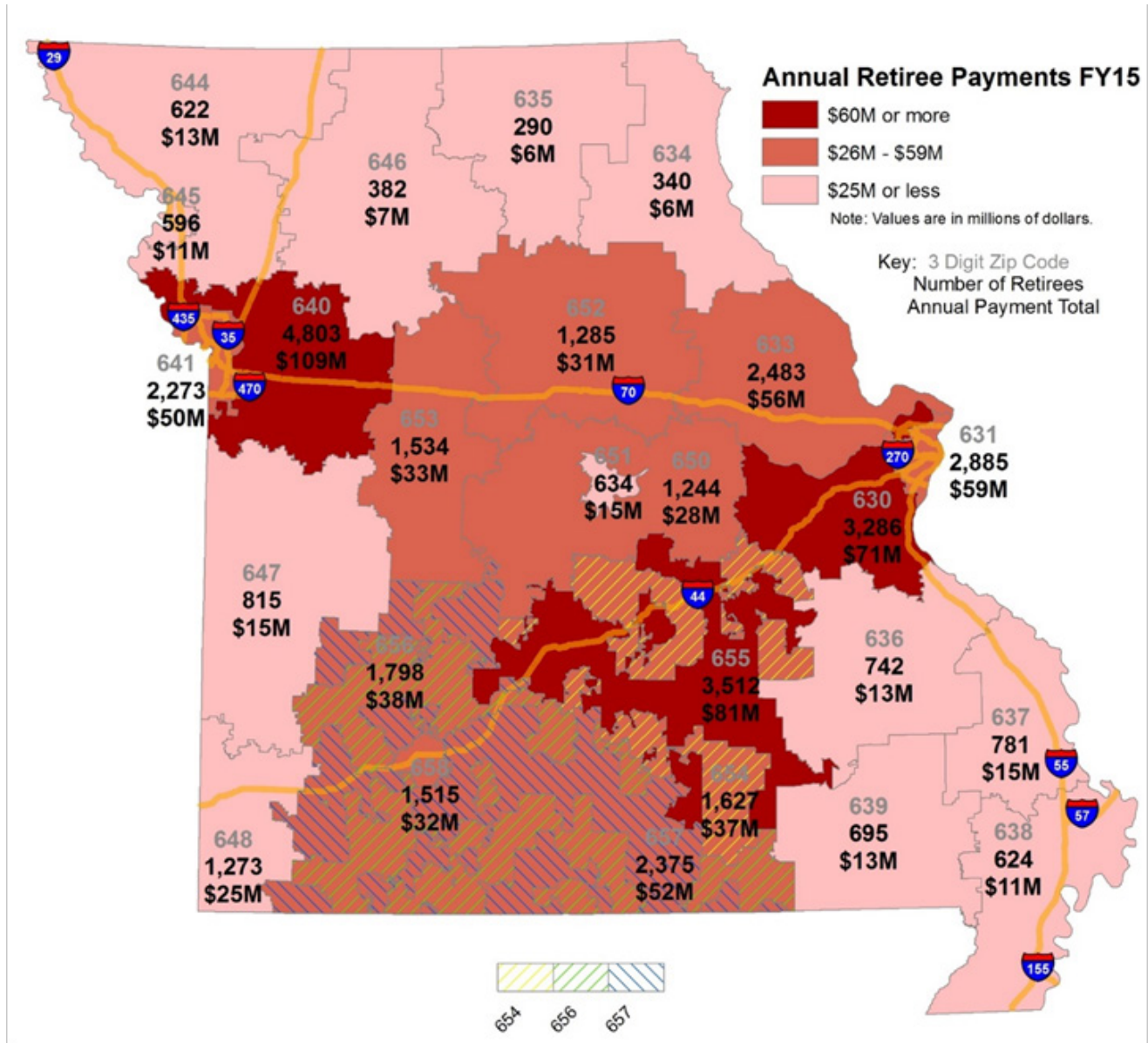


Figure 16 provides a map of where the retirees live around the state. While the entire state reaps the economic impact of military personnel retirements, there are some rural areas that are especially benefitted. Given that the total economic impact of retirees includes the creation of over 7,000 jobs, they constitute a strong economic asset for rural communities where they choose to live²⁰.

Figure 16 is a map showing the amount of retiree pay in each of the 3-digit zip codes for FY15 of the \$809 million total. Notice the many rural areas that benefit from their residents' military retirement pay.



Chapter 14: Economic Impact of Impact Aid to Schools in Missouri

Missouri attracts a sizeable number of military retirees who receive direct payments from the Department of Defense. Approximately 38,000 retirees who report their mailing address in Missouri received a total of nearly \$809 million on average in FY13, 14, and 15. This income spent in the region supports a variety of household, personal services, leisure, and hospitality activities and contributes to the tax base. Table 20 summarizes the total economic impact of military retirees living in Missouri both for FY15 alone and for the FY13-15 average .

This figure may understate the impact of retiree spending since retirees who live in nearby communities in bordering states but visit Missouri to take advantage of shopping, recreational, tourism and healthcare resources are not included.

Table 21- Economic Impact of Impact Aid to Schools in Missouri FY15

Economic Impacts of Impact Aid to Schools in Missouri, TOTAL			
Impact Aid Total Spending	Output Total Impact	Total Jobs Impact	Total Labor Income
\$27,694,040	\$46,999,977	535	\$28,427,846



A stylized graphic of the American flag, featuring blue stars on a dark blue background and white stripes on a lighter blue background, positioned at the top left of the page.

Section III

Methodology, Assumptions, and Limitations



Chapter 15: Outreach and Methodology

MU-BRIDG utilized key contacts and relationships to initiate and organize preliminary discussions with the primary DoD stakeholders in Missouri: the Missouri Department of Economic Development, Fort Leonard Wood, Whiteman Air Force Base, the Missouri National Guard, Army Reserves, Navy Reserves, Ft Leonard Wood Institute, local economic development organizations and school systems with large impact aid subsidies. In those discussions, the team engaged key leaders responsible for collecting economic data including military officers, school superintendents, and surrounding community business and civic leaders via both electronic and telephone interviews. Data gathering was done over a period of three and a half months from July to September 2016.

Economic impact analysis attempts to estimate the total contribution of different types of economic activities to a regional and/or state economy. An infusion of spending in one sector of the economy spurs additional economic activity in other sectors as the money is re-spent, generating a “multiplier” effect. Multipliers quantify direct industry impacts but also recognize inter-industry linkages and the successive rounds of spending that occur within the regional economy. The total economic contribution of this added spending is estimated by tracing the flow of money between industries and the households until all of the initial investment eventually leaves a region through foreign or domestic trade, or is collected as a tax.

The IMPLAN (IMPact analysis for PLANning) modeling system is used in this analysis to estimate the economic contribution of key state-based military assets. IMPLAN, a widely used proprietary software, is specifically tailored to reflect the expenditure patterns and industry mix of Missouri and to make estimates of the direct, indirect, and induced effects from various economic activities.

Direct effects refer to the gross expenditures and employment of the studied industry. Indirect effects are the spending and employment of suppliers and contractors to produce inputs for the industry. Induced effects include household spending on goods and services by both industry employees and the employees of contractors and suppliers (both direct and indirect employees). Total economic impact is the sum of direct, indirect, and induced effects.

Project Approach

The economic impact analysis we have prepared for military spending in Missouri uses IMPLAN modeling and is built on three major components:

- Expenditures at Missouri military facilities
- Department of Defense and Department of Energy contracts awarded to Missouri-based companies
- Pay to military retirees in the state

As input for the model, data was gathered on the operations expenditures, jobs and payroll, and construction spending by each installation and asset. This data was provided by the installations themselves, by state officials, or through publicly available data sources.

In the case of federal contracts, the model inputs were gathered from FPDS via USAspending.gov database where contracts were awarded to a company based in the state. It is assumed that the amount of awards where the “place of performance” (where the work was done) was outside the state were equivalent to the amount of awards to companies outside the state and the work was done inside the state. This approach was preferred to avoid the issue of clarity around the “place of performance” when it is recorded in one place, but actually takes place in another or in several others.

- Finally, we obtained data from the DoD Military Retired Pay File for FY13,14 and 15 on pay to military retirees in Missouri.
- Based on this data and the results from the model, three major types of economic impacts are reported in the study: Output total impact, total jobs created, and total household income created.
- Output represents the value of industry production. In this case, this is the value generated by state-based military assets.

Employment refers to all employees required to produce the outputs, including wage and salary employees; full-time and part-time employees; and the self-employed. Labor income refers to all forms of employment income, including employee compensation (wages and benefits) and proprietor income.

Careful efforts were made so as not to duplicate (double-count) or otherwise overstate the economic impact results. For instance, steps were taken to adjust contract awards spending to account for awards already included in the Kansas City National Security Center spending. Another example is that while this report focuses on fiscal year 2015, three year averages (FY13,14, and 15) were used where possible to account for anomalies in the year to year spending data.

While this study seeks to capture the vast majority of expenditures originating from the military assets in the state, not all expenditures may have been captured. For example, certain economic activities could not be measured given time and resources available for this study. Spending by retirees living in border states may not be fully represented in this analysis. This analysis is limited to the economic impacts to the state’s economy resulting from spending related to Missouri firms and payroll spending by Missouri residents.

Thus the results reported in this study can be considered a conservative analysis of the overall economic contributions of each installation and asset to the state’s economy. For example, the multipliers used in the IMPLAN modeling are more conservative than the previous analysis and thus provide a lower and more conservative estimate of economic impact.

Data Sources

Military Installations. University of Missouri Extension Business Research and Information Development Group (BRIDG) submitted data requests to the leadership at each of the military installations and two of the largest school systems receiving Impact Aid in the state. That resulted in data on jobs, payroll, operations spending, construction spending, and impact aid to schools for FY15 and in some cases FY13 and FY14. We appreciate the data provided by the installation leadership and schools involved. We wish to also thank many people involved who helped provide information and data for this study. All major military assets replied to our request for data, as did the Honeywell National Security Campus facility, school districts, community leaders and EDOs. Almost all minor military assets provided data as well.

Military Contracts. The federal defense contracts data were extracted from FPDS via USAspending.gov, a searchable website established by the Office of Management and Budget. The federal contracts data shown on USAspending.gov are provided directly by each federal agency. USAspending.gov received and displays data pertaining to obligations (amounts awarded and obligated for federally sponsored projects during a given budget period), not actual cash disbursements made against each project.

The defense contract data were analyzed from two aspects for this project. First, we examined all prime contracts awarded by the Department of Defense to companies based in the state in FY13,14 and 15. Second, we aggregated each year's awards and averaged them over the three fiscal years. Third, we analyzed the data to determine how many different companies in the state had won awards. For example, of the 61,000 plus transactions in FY15, there were almost 1,200 different establishments based on their DUNS numbers. That means approximately 1,200 companies in Missouri were impacted by military spending. The total for those contracts in FY15 was over \$9 billion, not counting the re-spending of those dollars throughout the state's economy.

The remaining analysis examined the value, industry, and contractor for Missouri. The industry sector was based on the principal NAICS code for the contractor. The top 10 contractors were identified by a unique DUNS number. That data was then used as input for the IMPLAN economic analysis.

Other. Inputs on pay to military retirees living in the state were obtained from the Department of Defense Military Pay File, FY2015. Veteran spending is not considered military spending and is therefore is not typically included in military spending economic impact. Still, knowing of the state's interest, the project team provided summary data on the number of veterans and estimated federal veteran expenditures in the state using US Department of Veterans Affairs data for FY13-15.





Chapter 16:

Assumptions and Limitations

The primary goal of this report is to assess the direct impacts of Department of Defense and Department of Energy spending in Missouri to operate their facilities, pay personnel (active, inactive, civilian, and retired), and award contracts to private firms. In addition to this spending other impacts include those from visitor spending and Impact Aid allocations as well as impacts to the local labor force in and around each major installation. The ability to calculate the quantitative impacts is dependent on the availability of reliable data. Much of the data used in this report are from publicly available federal sources, and to the extent possible, data directly provided by the major installations in the state (Whiteman AFB, Fort Leonard Wood, Missouri National Guard). Additional sources of data from smaller military installations, local tourism bureaus or local economic developers were also used.

There are other impacts on the state of Missouri from Department of Defense activities that are more difficult to track and are not included in this report. This unaccounted for activity is summarized in two ways: 1) subcontracts issued to Missouri--based firms from Department of Defense prime contractors that are located outside of Missouri, and 2) Department of Defense personnel that are assigned to a location outside of Missouri but live in Missouri. In both cases, Department of Defense dollars are indirectly entering the state and getting absorbed into the economy.

Regarding the prime contracts awarded to Missouri-based companies, it is assumed that there are out-of-state companies that win awards where the place of performance for the contract is in Missouri. Since this analysis uses the home state of the awardee rather than the place of performance it is assumed that the amount of awards won outside the state by Missouri companies equals the amount of awards won by out-of-state companies where the work is done inside the state leaving a net zero effect.

Regarding the subcontracts awarded to Missouri--based firms, it is assumed that in addition to subcontract dollars entering the state, subcontract dollars also leave the state, since prime contractors in Missouri may source goods and services from out-of-state firms. Without reliable data to track this inflow and outflow of dollars, it is assumed that this creates a net effect of zero. Therefore, only prime contractor dollars awarded to Missouri-based firms are considered.

Regarding the residence of personnel, in accordance to federal Personally Identifiable Information (PII) compliance requirements, the home locations of Department of Defense personnel is not publically available. This report relies upon anecdotal information on personnel residence from the major installations. This report does not make any estimates for the number of personnel stationed at installations outside of Missouri, but live in the state; most notably, personnel from Scott Air Force Base and Fort Leavenworth. These personnel are paid out-of-state, but bring their household earnings into Missouri, which, in turn, impacts the Missouri economy. At the same time, it is recognized that some workers at private firms or Department of Defense installations in Missouri may not live in Missouri. This “commuter effect” is not quantitatively assessable without reliable data; therefore, given the macro scale of the following analysis, it is assumed that there is a net effect of zero regarding Missouri-- based workers living outside of Missouri and workers based outside of Missouri living in Missouri.





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